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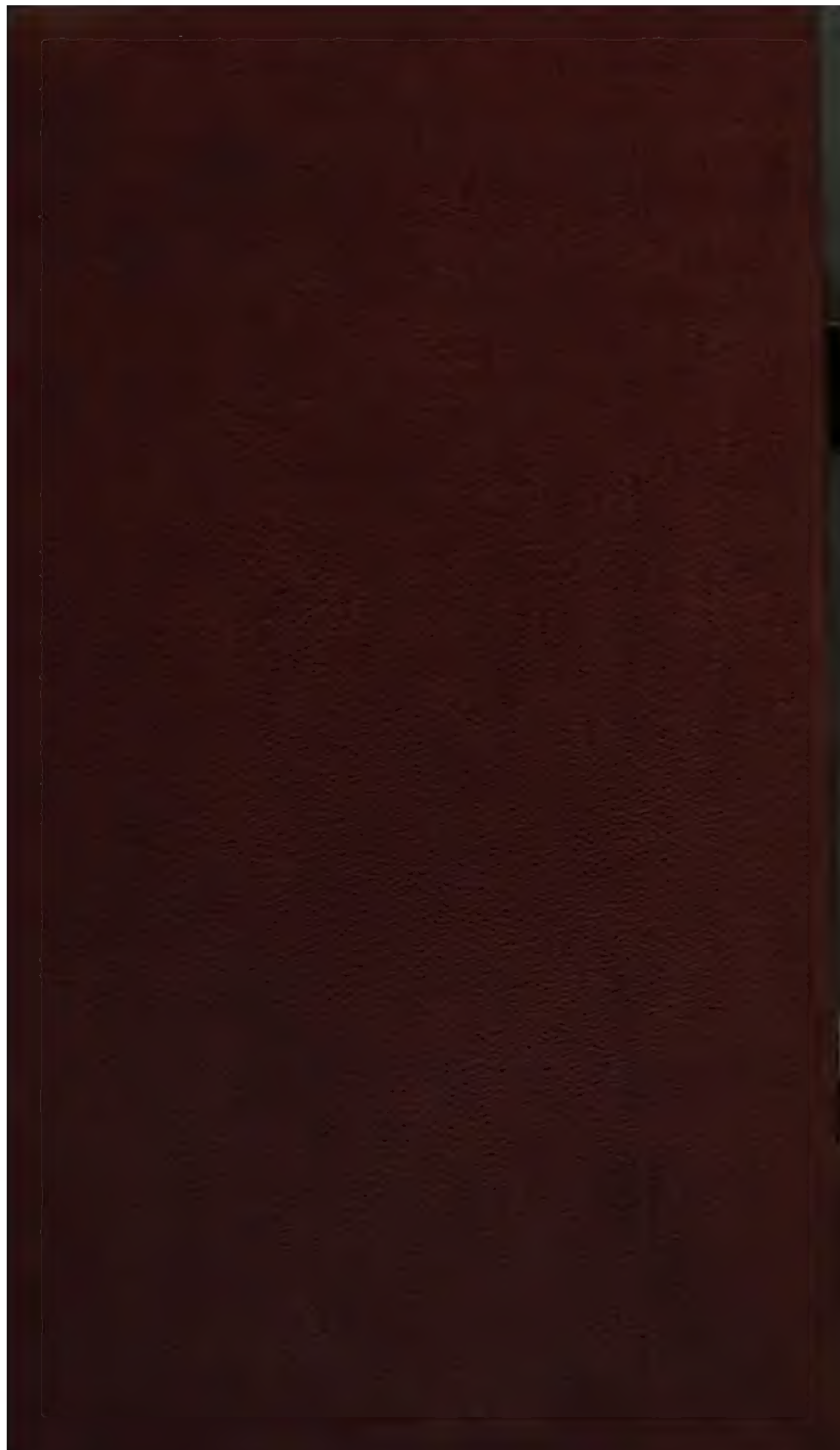
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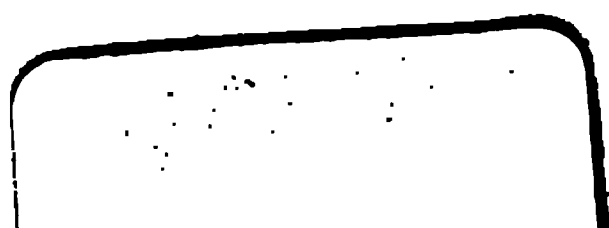
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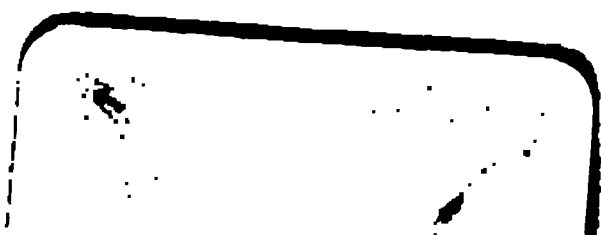
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TIDE TABLES
FOR THE
BRITISH AND IRISH PORTS,
FOR THE YEAR
1863 ;

**ALSO THE TIMES AND HEIGHTS OF HIGH WATER AT FULL AND CHANGE
FOR THE PRINCIPAL PLACES ON THE GLOBE.**

COMPUTED BY JOHN BURDWOOD, MASTER, R.N.

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**FURNISHED BY ORDER OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.**  
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Price One Shilling and Sixpence.

1862.



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NOTICE.

If it be desired to reduce the Mean Time at any Place to that of Greenwich (or Railway) Time, (which latter is used in the Tide Tables, published in Liverpool and Glasgow,) the following correction must be applied to the Time given in these Tables :—

			Minutes.
Brest	-	-	+ 18
Devonport	-	-	+ 17
Portsmouth	-	-	+ 4
Dover	-	-	— 5
Sheerness	-	-	— 3
Harwich	-	-	— 5
Hull	-	-	+ 1
Sunderland	-	-	+ 5
North Shields	-	-	+ 6
Leith	-	-	+ 13
Thurso	-	-	+ 14
Greenock	-	-	+ 19
Liverpool	-	-	+ 12
Pembroke	-	-	+ 20
Weston-super-mare	-	-	+ 12
Holyhead	-	-	+ 18

For the Irish Ports, should Dublin Mean Time be required, the following correction must be applied to the time given in these Tables :—

			Minutes.
Kingstown	-	-	— 1
Belfast	-	-	— 2
Londonderry	-	-	+ 4
Sligo	-	-	+ 9
Galway	-	-	+ 11
Queenstown (Cork)	-	-	+ 8
Waterford	-	-	+ 3

The above corrections are also given at the foot of each page under the place for which the times and heights of high water are predicted.

ADVERTISEMENT.

IN the following Tables the time of High Water is given to *Mean* time at Place. Those who are desirous of knowing the *Apparent* time, (or that shown by the Sun,) at which High Water occurs, must apply the equation of time, by addition or subtraction, as directed for that purpose.

The height of the tide in these Tables is calculated from the mean level of the low water of ordinary springs, because the soundings expressed in most charts are reduced to that level. The height therefore which is given at each place is the actual rise of high water above the mean low-water level of spring-tides.

In the column of the Moon's transit, (m) stands for morning, and (a) for afternoon.

The Moon's age is given in days, and tenths of a day, from the time of her conjunction, or change; thus, it is New Moon on the 17th of May, at 4 h. 48 m. in the afternoon, and therefore, on the 18th of May, at noon, the moon being 19 h. 12 m. old, her age may be accounted as eight tenths of a day, and is expressed by 0.8.

The highest equinoctial tides take place, on the west coast of Ireland and on the south coast of England, three transits after the New and Full Moon, unless diverted by gales of wind or other extraordinary causes. Along the east coast of England, they take place four transits after the New and Full Moon. In the river Thames they occur five transits after the same epoch. These differences arise from the cause, that the same tide-wave which produces high water on the west coast of Ireland takes half a day in its progress from thence to the east coast of England, and a whole day before it arrives in the river Thames.

The time of high water at Brest is added for the benefit of vessels navigating the north coast of France and the adjacent sea.

Immediately after the Tide Tables, at page 98, will be found a convenient method of deducing, from them, the height of the tide at any intermediate hour, between high and low water.

The next Table, at page 101, shows the depths on the dock-sills at Falmouth, Devonport, Plymouth, Portsmouth, Sheerness, Chatham, Woolwich, Deptford, London, Hull, Middlesbrough, Hartlepool, Sunderland, Leith, Pembroke, Liverpool, Birkenhead, Dublin, and Londonderry.

In page 103 will be found a collection of Constant Differences, by which the time and height of high water at certain other ports may be approximately found. If the authorities at the different ports would transmit to the Admiralty six months' observations (at least) of the times and heights of high and low water, these Constants might be usefully increased.

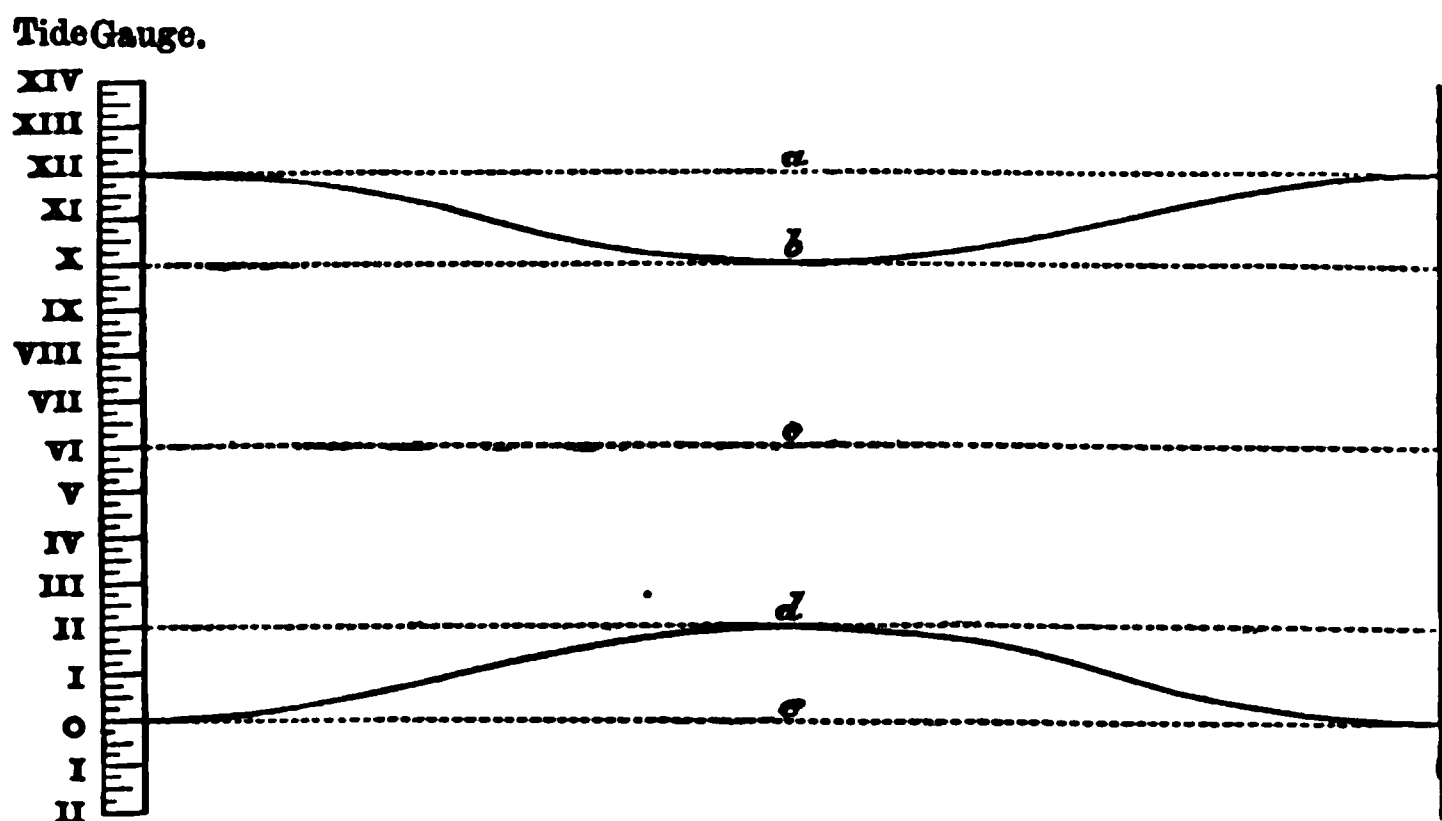
In page 108 a description is given of the general set of the tides in the neighbourhood of several parts of the coast, including a full account of the streams among the Orkneys, and through the Pentland Firth, by Com. F. W. L. Thomas, R. N. And, the development, by Rear-Admiral F. W. Beechey, of the movement of the great tide-wave up the English and Irish Channels, and into the North Sea; to which has been added a description of the set of the tides in the vicinity of Rathlin Island on the north coast of Ireland by Richard Hoskyn, Master, R. N.

Lastly, there is appended the time of high water on the days of Full and Change at various places on the globe arranged according to the apparent progress of the tide-wave, and also alphabetically; with the rise of the tide at springs and neaps.

The stations at the several ports where the tidal observations were made on which the predictions in these tables are based, are as follows,—viz :—

Brest, entrance of the basin—Devonport, Dockyard—Portsmouth, Dockyard—Dover, North Pier—Sheerness, Dockyard—London Docks (reduced to London Bridge the latter being given in these tables, by applying to the times at the docks $+10^m$ and to the heights -4^{ins})—Harwich, Angel Quay—Hull, Victoria Dock—Sunderland North Dock—North Shields, Low Lighthouse—Leith, East Pier—Thurso, near Scrabster Pier—Greenock, East Dock—Liverpool, St. Georges Pier—Pembroke Dockyard—Weston-super-mare, Bairnbach Island—Holyhead, Pier—Kingstown Watering Pier—Belfast, New Dock—Londonderry, Ship Bridge—Sligo Bay, Mullaghmore—Galway, Nimmos Pier—Queenstown, Scott's Wharf—Waterford, Duncannon Fort.

The following diagram is intended to explain the terms Spring Rise, Neap Rise and Neap Range as made use of on the Admiralty Charts and in the Sailing Directions published by the Admiralty :—



- a = Mean Level of High Water Ordinary Springs.
 b = " " " Neaps.
 c = Half Tide or Mean Level of the sea both at Springs and Neaps.
 d = Mean Level of Low Water Ordinary Neaps.
 e = " " " Springs.

Example.

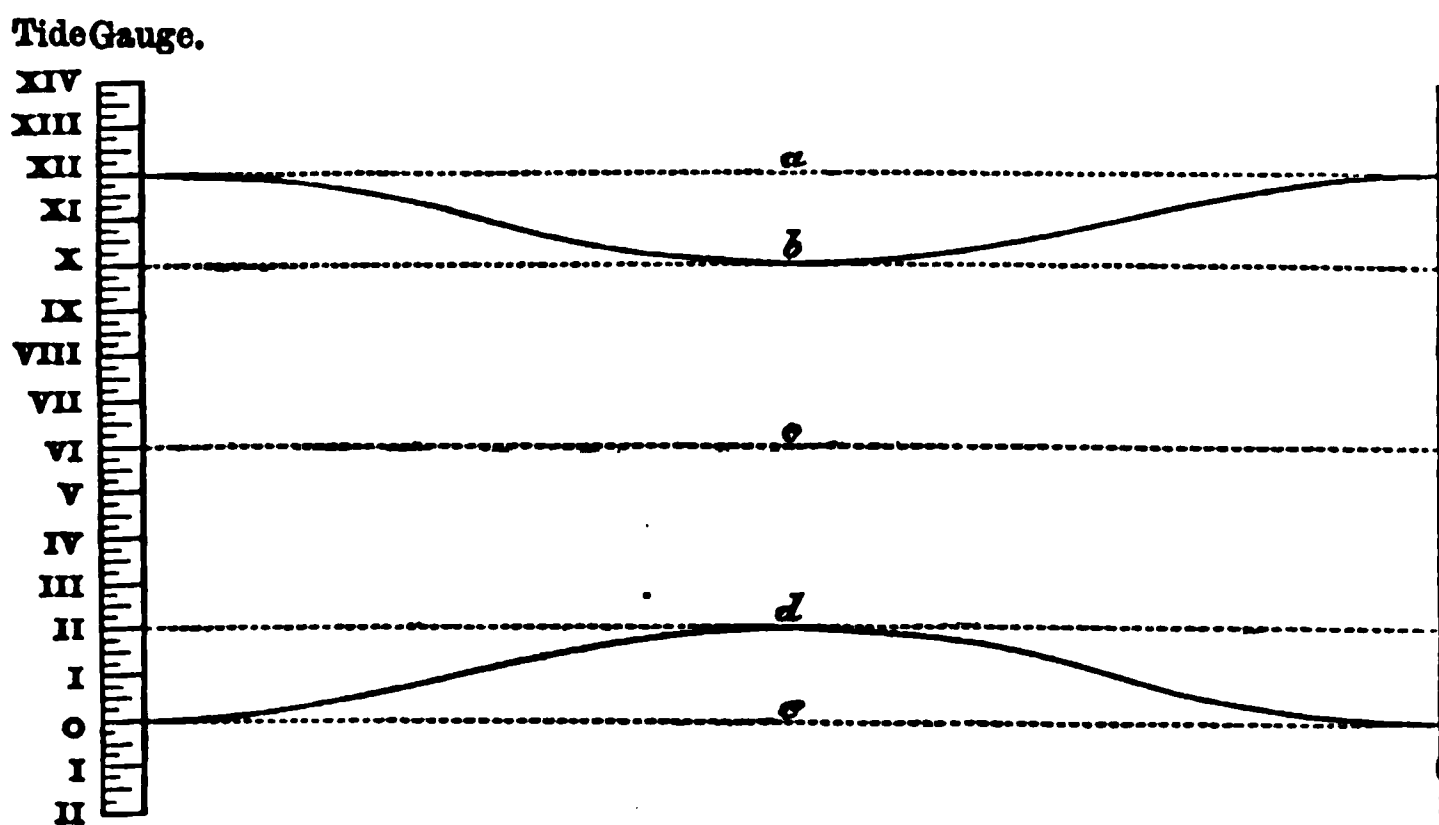
		ft.
Spring Rise (or Mean Spring Range)	= e to a	= 12
Neap Rise	= e to b	= 10
Neap Range	= d to b	= 8

TIDE TABLES
FOR THE
BRITISH AND IRISH PORTS
FOR THE YEAR
1863.

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Example.

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Neap Rise	= e to b	= 10	
Neap Range	= d to b	= 8	

TIDE TABLES
FOR THE
BRITISH AND IRISH PORTS
FOR THE YEAR
1863.

TIDE TABLES FOR THE

JANUARY, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.																		
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.																
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.															
Th.	1	9a32	0	58	14	1	1	26	14	5	2	23	12	6	2	54	12	8	8	48	10	4	9	17	10	7			
F.	2	10 20	1	52	14	11	2	16	15	4	3	25	13	1	3	52	13	1	9	44	10	9	10	10	10	11			
S.	3	11 9	2	36	15	9	2	55	16	2	4	18	13	9	4	41	13	6	10	30	11	1	10	51	11	3			
M.	4	11 57	3	13	16	7	3	33	16	11	5	3	14	3	5	22	13	10	11	9	11	5	11	29	11	7			
M.	5	morn.	3	50	17	2	4	7	17	4	5	41	14	8	5	59	14	0	11	46	11	8	—	—	—	—			
Tu.	6	0 44	4	25	17	6	4	43	17	8	6	16	14	11	6	35	14	2	0	3	11	9	0	22	11	10			
W.	7	1 30	4	58	17	9	5	13	17	10	6	52	15	1	7	6	14	3	0	40	11	11	0	57	11	11			
Th.	8	2 14	5	30	17	9	5	46	17	9	7	21	15	0	7	38	14	1	1	13	12	0	1	31	12	0			
F.	9	2 58	6	4	17	8	6	22	17	6	7	53	14	9	8	11	13	10	1	48	12	0	2	5	11	11			
S.	10	3 41	6	41	17	3	6	59	16	11	8	28	14	3	8	45	13	7	2	23	11	11	2	42	11	10			
M.	11	4 25	7	18	16	5	7	39	16	2	9	0	13	10	9	18	13	4	3	0	11	8	3	19	11	6			
M.	12	5 12	8	0	15	8	8	24	15	3	9	40	13	5	10	2	12	11	3	39	11	4	3	58	11	2			
Tu.	13	6 0	8	50	14	9	9	19	14	6	10	27	12	11	10	55	12	8	4	21	11	0	4	46	10	9			
W.	14	6 53	9	52	14	5	10	32	14	4	11	25	12	7	—	—	—	5	14	10	6	5	45	10	4	4			
Th.	15	7 50	11	15	14	6	11	59	14	10	0	1	12	7	0	42	12	7	6	23	10	4	7	4	10	4			
F.	16	8 50	—	—	—	—	0	39	15	4	1	22	12	11	2	5	13	0	7	46	10	7	8	28	10	11			
S.	17	9 54	1	15	16	0	1	47	16	10	2	44	13	9	3	24	13	9	9	6	11	4	9	39	11	9			
M.	18	10 57	2	17	17	9	2	43	18	7	3	58	14	8	4	30	14	8	10	12	12	2	10	39	12	6			
M.	19	11 58	3	9	19	5	3	35	19	10	5	0	15	8	5	28	15	4	11	5	12	10	11	31	13	0			
Tu.	20	0a56	4	0	20	2	4	24	20	6	5	54	16	3	6	21	15	8	11	55	13	2	—	—	—	—			
W.	21	1 50	4	46	20	7	5	8	20	6	6	45	16	8	7	7	15	11	0	20	13	4	0	44	13	4			
Th.	22	2 41	5	29	20	4	5	50	20	1	7	28	16	7	7	49	15	8	1	7	13	4	1	29	13	3			
F.	23	3 30	6	10	19	8	6	30	19	2	8	10	16	1	8	29	15	3	1	51	13	2	2	11	13	0			
S.	24	4 18	6	51	18	5	7	11	17	9	8	48	15	5	9	4	14	7	2	31	12	9	2	51	12	5			
M.	25	5 4	7	32	16	11	7	53	16	1	9	19	14	5	9	38	13	9	3	11	12	1	3	31	11	9			
M.	26	5 51	8	13	15	3	8	36	14	6	9	58	13	4	10	16	12	10	3	51	11	4	4	11	11	0			
Tu.	27	6 39	9	1	13	10	9	31	13	3	10	39	12	5	11	4	12	1	4	33	10	7	4	57	10	2			
W.	28	7 27	10	8	12	11	10	50	12	8	11	32	11	8	—	—	—	5	25	9	10	6	1	9	7	7			
Th.	29	8 16	11	33	12	8	—	—	—	—	0	7	11	8	0	45	11	4	6	40	9	5	7	22	9	6			
F.	30	9 5	0	16	12	10	0	53	13	2	1	24	11	11	2	3	11	7	8	3	9	7	8	42	9	10			
S.	31	9 53	1	27	13	9	1	55	14	3	2	41	12	5	3	18	12	3	9	18	10	2	9	47	10	6			
Half Mean Spring Range.			9 ⁿ . 6 ⁱⁿ .				7 ⁿ . 9 ⁱⁿ .				6 ⁿ . 4 ⁱⁿ .																		
Phases of the Moon.															Moon's Declination at Noon.														
D. H. M.															M.D. ° /														
Full - - - - - 5 3 32 Morning.															1 21 N. 45 ■ 4 N. 7 17 22 8. 25 25 12 N. 7														
Last Quarter - 13 0 6 Morning.															2 22 39 10 0 2. 41 18 20 42 26 15 58														
New - - - - - 19 4 2 Afternoon.															3 22 33 11 5 34 19 17 30 27 19 1														
First Quarter - 26 4 54 Afternoon.															4 21 26 12 10 18 20 13 11 28 21 11														
															5 19 23 13 14 40 21 8 8 29 22 23														
In Apogee - - 3 2 0 Afternoon.															6 16 29 14 18 23 22 2 46 30 22 35														
In Perigee - - 18 5 0 Afternoon.															7 12 52 15 21 7 23 2 N. 34 31 21 46														
In Apogee - - 30 12 0 Midnight.															8 8 42 16 22 33 24 7 36														

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 Brest add 12 m. | Devonport add 17 m. | Portsmouth add 4 m.

JANUARY, 1863.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	
Th.	1	8 13 14 10		8 42 15 2	10 2 13 5	10 34 13 7	11 28 15 10	—	—	11'3				
F.	2	9 7 15 6		9 33 15 9	11 1 13 10	11 26 14 0	0 2 16 0	0 30 16 2	12'3	0 2 16 0	0 30 16 2	12'3		
S.	3	9 54 16 1		10 15 16 4	11 49 14 3	—	—	0 55 16 5	1 18 16 8	13'3				
S.	4	10 35 16 7		10 56 16 10	0 7 14 5	0 27 14 7	1 40 16 11	1 58 17 2	14'3	1 40 16 11	1 58 17 2	14'3		
M.	5	11 16 17 1		11 36 17 3	0 45 14 9	1 5 14 11	2 17 17 5	2 35 17 8	15'3	2 17 17 5	2 35 17 8	15'3		
Tu.	6	11 55 17 5		—	—	1 22 15 1	1 39 15 2	2 52 17 10	3 9 18 0	16'3				
W.	7	0 14 17 6		0 31 17 8	1 57 15 3	2 14 15 4	3 25 18 2	3 42 18 4	17'3	3 25 18 2	3 42 18 4	17'3		
Th.	8	0 48 17 9		1 7 17 9	2 29 15 4	2 44 15 4	3 59 18 5	4 16 18 5	18'3	4 16 18 5	4 16 18 5	18'3		
F.	9	1 26 17 9		1 45 17 8	3 1 15 4	3 17 15 3	4 33 18 5	4 48 18 5	19'3	4 33 18 5	4 48 18 5	19'3		
S.	10	2 3 17 7		2 22 17 6	3 34 15 2	3 52 15 1	5 5 18 4	5 23 18 3	20'3	5 5 18 4	5 23 18 3	20'3		
S.	11	2 42 17 3		3 1 17 0	4 11 14 11	4 30 14 9	5 41 18 1	5 58 17 11	21'3	5 41 18 1	5 58 17 11	21'3		
M.	12	3 20 16 8		3 39 16 4	4 49 14 6	5 9 14 4	6 17 17 9	6 39 17 6	22'3	6 17 17 9	6 39 17 6	22'3		
Tu.	13	4 2 16 0		4 26 15 7	5 32 14 1	5 57 13 10	7 1 17 3	7 24 16 11	23'3	7 1 17 3	7 24 16 11	23'3		
W.	14	4 52 15 3		5 20 15 0	6 25 13 7	6 58 13 5	7 53 16 9	8 25 16 6	24'3	7 53 16 9	8 25 16 6	24'3		
Th.	15	5 54 14 11		6 31 15 0	7 33 13 5	8 14 13 5	9 2 16 4	9 41 16 3	25'3	9 2 16 4	9 41 16 3	25'3		
F.	16	7 12 15 5		7 54 15 11	8 56 13 7	9 37 13 11	10 22 16 4	11 4 16 6	26'3	10 22 16 4	11 4 16 6	26'3		
S.	17	8 31 16 5		9 3 17 1	10 16 14 4	10 50 14 8	11 43 16 9	—	—	27'3				
S.	18	9 35 17 8		10 4 18 3	11 21 15 2	11 50 15 7	0 18 17 2	0 50 17 8	28'3	0 18 17 2	0 50 17 8	28'3		
M.	19	10 32 18 10		11 0 19 3	—	0 16 16 0	1 19 18 2	1 47 18 8	29'3	1 19 18 2	1 47 18 8	29'3		
Tu.	20	11 27 19 6		11 53 19 9	0 42 16 4	1 7 16 7	2 13 19 2	2 38 19 6	30'8	2 13 19 2	2 38 19 6	30'8		
W.	21	—		0 18 19 11	1 31 16 9	1 55 16 11	3 1 19 9	3 25 20 0	31'8	3 1 19 9	3 25 20 0	31'8		
Th.	22	0 42 19 11		1 5 19 10	2 17 16 11	2 39 16 10	3 48 20 1	4 8 20 1	32'8	3 48 20 1	4 8 20 1	32'8		
F.	23	1 28 19 7		1 50 19 4	2 59 16 9	3 20 16 7	4 30 20 0	4 52 19 10	33'8	4 30 20 0	4 52 19 10	33'8		
S.	24	2 11 18 11		2 33 18 5	3 40 16 4	4 0 16 0	5 12 19 7	5 31 19 3	34'8	5 12 19 7	5 31 19 3	34'8		
S.	25	2 53 17 11		3 13 17 3	4 21 15 7	4 41 15 2	5 51 18 10	6 11 18 5	35'8	5 51 18 10	6 11 18 5	35'8		
M.	26	3 32 16 8		3 52 16 0	5 2 14 9	5 23 14 3	6 32 18 0	6 54 17 5	36'8	6 32 18 0	6 54 17 5	36'8		
Tu.	27	4 13 15 5		4 35 14 9	5 45 13 10	6 10 13 6	7 15 16 11	7 39 16 6	37'8	7 15 16 11	7 39 16 6	37'8		
W.	28	5 2 14 2		5 34 13 9	6 38 13 1	7 11 12 9	8 8 16 1	8 40 15 8	38'8	8 8 16 1	8 40 15 8	38'8		
Th.	29	6 9 13 6		6 48 13 7	7 49 12 7	8 31 12 6	9 17 15 5	9 57 15 2	39'8	9 17 15 5	9 57 15 2	39'8		
F.	30	7 29 13 9		8 8 14 1	9 13 12 8	9 54 12 10	10 37 15 2	11 19 15 3	40'8	10 37 15 2	11 19 15 3	40'8		
S.	31	8 43 14 7		9 10 15 0	10 30 13 1	11 2 13 5	11 58 15 5	—	—	41'8				
Half Mean Spring } Range.		9ft. 4in.				8ft. 0in.				9ft. 7in.				
Equation of Time at Noon.														
M.D.	M.	R.	Sub.	M.D.	M.	R.	Sub.	M.D.	M.	R.	Sub.	M.D.	M.	R.
1	3	45	Sub.	9	7	19	Sub.	17	10	19	Sub.	25	12	35
2	4	13		10	7	44		18	10	29		26	12	48
3	4	41		11	8	8		19	10	58		27	13	1
4	5	9		12	8	31		20	11	16		28	13	12
5	5	36		13	8	54		21	11	33		29	13	23
6	6	2		14	9	16		22	11	50		30	13	33
7	6	28		15	9	38		23	12	6		31	13	43
8	6	54		16	9	59		24	12	21				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 Dover subtract 5 m. | SHEERNESS subtract 5 m. | LONDON 6 m.

TIDE TABLES FOR THE

JANUARY, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.															
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.													
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.												
Th.	1	08 32	9	9	9	11	9	41	10	0	3	30	16	9	4	3	17	1	0	22	11	2	0	53	11	5
F.	2	10 20	10	9	10	2	10	36	10	4	4	30	17	5	4	55	17	9	1	20	11	8	1	45	11	11
S.	3	11 9	11	0	10	5	11	20	10	7	5	17	18	1	5	36	18	4	2	11	12	2	2	32	12	4
S.	4	11 57	11	41	10	9	11	59	10	10	5	56	18	6	6	15	18	9	2	53	12	6	3	11	12	9
M.	5	morn.	—	—	—	—	0	19	10	11	6	35	19	0	6	53	19	2	3	29	12	11	3	46	13	1
Tu.	6	0 44	0	36	10	11	0	52	11	0	7	11	19	4	7	29	19	6	4	3	13	3	4	19	13	5
W.	7	1 30	1	10	11	0	1	28	11	0	7	47	19	7	8	3	19	9	4	37	13	6	4	52	13	7
Th.	8	2 14	1	44	11	0	1	59	11	0	8	17	19	10	8	35	19	9	5	8	13	7	5	25	13	6
F.	9	2 58	2	17	10	11	2	34	10	11	8	51	19	8	9	10	19	7	5	42	13	5	6	1	13	3
S.	10	3 41	2	52	10	10	3	10	10	9	9	28	19	4	9	47	19	1	6	19	13	2	6	39	13	0
S.	11	4 25	3	29	10	8	3	47	10	7	10	5	18	10	10	24	18	7	7	0	12	9	7	20	12	7
M.	12	5 12	4	5	10	6	4	25	10	4	10	45	18	3	11	9	17	11	7	41	12	4	8	4	12	2
Tu.	13	6 0	4	45	10	3	5	10	10	11	11	38	17	7	—	—	—	—	8	29	11	11	8	57	11	8
W.	14	6 53	5	36	10	0	6	5	9	11	0	10	17	3	0	42	16	11	9	29	11	6	10	3	11	5
Th.	15	7 50	6	39	9	11	7	22	9	11	1	15	16	10	1	51	16	10	10	42	11	4	11	22	11	6
F.	16	8 50	8	4	10	1	8	44	10	3	2	29	17	1	3	6	17	6	11	59	11	9	—	—	—	—
S.	17	9 54	9	23	10	6	9	58	10	9	3	44	18	2	4	19	18	10	0	35	12	2	1	9	12	8
S.	18	10 57	10	31	11	1	11	1	11	4	4	50	19	6	5	18	20	1	1	41	13	2	2	13	13	7
M.	19	11 58	11	29	11	7	11	55	11	10	5	45	20	8	6	11	21	2	2	41	14	0	3	7	14	5
Tu.	20	08 56	—	—	—	—	0	20	12	0	6	38	21	6	7	3	21	10	3	31	14	9	3	55	15	0
W.	21	1 50	0	44	12	1	1	8	12	1	7	27	22	1	7	51	22	2	4	18	15	3	4	40	15	4
Th.	22	2 41	1	32	12	1	1	54	12	0	8	13	22	2	8	34	22	0	5	2	15	4	5	23	15	2
F.	23	3 30	2	15	11	11	2	37	11	9	8	55	21	9	9	15	21	4	5	45	14	10	6	6	14	6
S.	24	4 18	2	58	11	7	3	18	11	5	9	36	20	9	9	57	20	2	6	27	14	2	6	49	13	8
S.	25	5 4	3	38	11	2	3	58	10	11	10	17	19	7	10	38	18	11	7	11	13	3	7	34	12	10
M.	26	5 51	4	18	10	8	4	38	10	4	11	0	18	3	11	25	17	7	7	55	12	4	8	18	11	10
Tu.	27	6 39	4	59	10	1	5	22	9	10	11	52	17	0	—	—	—	—	8	42	11	6	9	9	11	1
W.	28	7 27	5	47	9	8	6	17	9	6	0	23	16	4	0	55	15	10	9	42	10	8	10	20	10	5
Th.	29	8 16	6	56	9	4	7	40	9	4	1	30	15	6	2	7	15	4	10	59	10	4	11	38	10	4
F.	30	9 5	8	21	9	5	9	1	9	6	2	45	15	6	3	23	15	10	—	—	—	—	0	15	10	6
S.	31	9 53	9	38	9	8	10	10	9	11	3	58	16	3	4	31	16	9	0	50	10	10	1	21	11	2
Half Mean Spring Range.			5 ft. 9 in.				10 ft. 5 in.				7 ft. 2 in.															
Phases of the Moon.							Moon's Declination at Noon.																			
D. H. M.							M. D.	°	'	M. D.	°	'	M. D.	°	'	M. D.	°	'								
Full - - - 5 3 32 Morning.							1	21	N. 45	9	4	N. 7	17	22	S. 25	25	12	N. 7								
Last Quarter - 13 0 6 Morning.							2	22	39	10	0	S. 41	18	20	42	26	15	58								
New - - - 19 4 2 Afternoon.							3	22	33	11	5	34	19	17	30	27	19	1								
First Quarter - 26 4 54 Afternoon.							4	21	26	12	10	18	20	13	11	28	21	11								
							5	19	23	13	14	40	21	8	8	29	22	23								
In Apogee - 3 2 0 Afternoon.							6	16	29	14	18	33	22	2	46	30	22	35								
In Perigee - 18 5 0 Afternoon.							7	12	52	15	21	7	23	2	N. 34	31	21	46								
In Apogee - 30 12 0 Midnight.							8	8	42	16	22	33	24	7	36											

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

BRITISH AND IRISH PORTS.

JANUARY, 1863.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	
Th.	1	0 36	10 2	1 5	10 4	12 0	12 10	—	—	6 1	9 7	6 27	9 10	11'3
F.	2	1 31	10 6	1 54	10 8	0 25	13 1	0 48	13 5	6 49	10 2	7 9	10 7	12'3
S.	3	2 17	10 11	2 36	11 2	1 11	13 9	1 31	14 1	7 26	10 11	7 42	11 3	13'3
S.	4	2 54	11 5	3 12	11 8	1 50	14 4	2 7	14 7	7 58	11 7	8 16	11 10	14'3
M.	5	3 29	11 10	3 45	12 0	2 27	14 10	2 44	15 1	8 32	12 0	8 49	12 1	15'3
Tu.	6	4 3	12 2	4 21	12 3	3 1	15 2	3 16	15 3	9 5	12 2	9 22	12 3	16'3
W.	7	4 38	12 4	4 54	12 4	3 33	15 3	3 50	15 3	9 39	12 3	9 55	12 3	17'3
Th.	8	5 10	12 3	5 28	12 3	4 6	15 3	4 23	15 2	10 13	12 2	10 31	12 2	18'3
F.	9	5 46	12 2	6 5	12 1	4 41	15 1	4 59	15 1	10 50	12 0	11 8	11 10	19'3
S.	10	6 23	12 0	6 42	11 11	5 17	15 0	5 37	14 10	11 29	11 7	11 50	11 5	20'3
S.	11	7 2	11 9	7 21	11 7	5 57	14 7	6 18	14 4	—	—	0 10	11 2	21'3
M.	12	7 43	11 4	8 8	11 0	6 40	14 1	7 3	13 10	0 31	10 11	0 55	10 8	22'3
Tu.	13	8 35	10 8	9 6	10 5	7 30	13 6	8 0	13 3	1 21	10 5	1 51	10 2	23'3
W.	14	9 39	10 4	10 16	10 3	8 33	13 1	9 9	13 0	2 24	10 0	3 1	9 11	24'3
Th.	15	10 54	10 4	11 34	10 6	9 49	13 0	10 28	13 2	3 45	9 10	4 27	9 11	25'3
F.	16	—	—	0 13	10 9	11 6	13 5	11 42	13 9	5 7	10 1	5 44	10 5	26'3
S.	17	0 49	11 1	1 21	11 6	—	—	0 15	14 2	6 17	10 11	6 44	11 6	27'3
S.	18	1 50	11 11	2 18	12 5	0 44	14 9	1 12	15 5	7 10	12 3	7 32	12 11	28'3
M.	19	2 43	12 11	3 7	13 4	1 39	16 0	2 5	16 6	7 54	13 6	8 18	13 10	29'3
Tu.	20	3 31	13 8	3 55	13 11	2 30	16 10	2 53	17 1	8 41	14 1	9 3	14 3	30'8
W.	21	4 19	14 1	4 42	14 2	3 15	17 21	3 37	17 3	9 26	14 3	9 49	14 2	31'8
Th.	22	5 5	14 0	5 27	13 10	3 59	17 2	4 21	17 0	10 11	14 0	10 33	13 9	32'8
F.	23	5 48	13 8	6 10	13 4	4 39	16 9	5 6	16 5	10 55	13 4	11 17	12 11	33'8
S.	24	6 31	13 0	6 53	12 8	5 25	16 1	5 47	15 8	11 40	12 5	—	—	34'8
S.	25	7 13	12 3	7 35	11 9	6 9	15 2	6 32	14 8	0 1	12 0	0 23	11 6	35'8
M.	26	7 59	11 3	8 23	10 8	6 54	14 1	7 17	13 6	0 46	10 11	1 9	10 5	36'8
Tu.	27	8 49	10 3	9 19	9 10	7 44	13 1	8 13	12 7	1 34	10 0	2 4	9 6	37'8
W.	28	9 54	9 6	10 32	9 4	8 46	12 2	9 25	11 11	2 38	9 2	3 19	8 10	38'8
Th.	29	11 11	9 4	11 51	9 5	10 6	11 10	10 44	11 11	4 3	8 9	4 44	8 8	39'8
F.	30	—	—	0 29	9 7	11 22	12 0	11 57	12 3	5 24	8 9	5 59	8 11	40'8
S.	31	1 4	9 9	1 33	10 0	—	—	0 28	12 7	6 29	9 3	6 53	9 9	41'8
Half Mean Spring Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Half Mean Spring }
Range. } 6ft. 8in.

8ft. 2in.

6ft. 7in.

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	3	45	Sub.	9	7	19	Sub.	17	10	19	Sub.	25	12	35	Sub.
2	4	13		10	7	44		18	10	39		26	12	48	
3	4	41		11	8	8		19	10	58		27	13	1	
4	5	9		12	8	31		20	11	16		28	13	12	
5	5	36		13	8	54		21	11	33		29	13	23	
6	6	2		14	9	16		22	11	50		30	13	33	
7	6	28		15	9	38		23	12	6		31	13	43	
8	6	54		16	9	59		24	12	21					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required—for
NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

TIDE TABLES FOR THE

JANUARY, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.									
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.							
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
Th.	1	9 32	9 10	8 4	9 39	8 5	8 37	20 9	9 4	21 2	3 3	15 11	3 34	16 4						
F.	2	10 20	10 5	8 6	10 31	8 7	9 28	21 8	9 51	22 1	4 3	16 10	4 30	17 3						
M.	3	11 9	10 52	8 8	11 13	8 9	10 10	22 6	10 29	22 9	4 54	17 8	5 16	18 0						
W.	4	11 57	11 33	8 10	11 54	8 11	10 46	23 1	11 6	23 5	5 37	18 4	5 59	18 8						
Th.	5	morn.	—	—	0 12	9 1	11 24	23 9	11 43	24 0	6 17	19 0	6 34	19 3						
F.	6	0 44	0 31	9 2	0 49	9 3	—	—	0 1	24 2	6 52	19 5	7 9	19 7						
M.	7	1 30	1 7	9 3	1 24	9 4	0 18	24 5	0 34	24 7	7 25	19 8	7 41	19 9						
W.	8	2 14	1 40	9 4	1 57	9 5	0 50	24 8	1 7	24 7	7 57	19 9	8 14	19 8						
Th.	9	2 58	2 13	9 5	2 31	9 5	1 24	24 5	1 41	24 3	8 32	19 7	8 50	19 5						
F.	10	3 41	2 48	9 4	3 7	9 4	1 58	24 1	2 17	23 9	9 9	19 2	9 26	18 10						
M.	11	4 25	3 24	9 3	3 42	9 2	2 35	23 5	2 52	23 1	9 44	18 6	10 2	18 2						
W.	12	5 12	4 2	9 1	4 22	9 0	3 12	22 9	3 33	22 3	10 20	17 10	10 42	17 5						
Th.	13	6 0	4 46	8 11	5 11	8 9	3 57	21 9	4 25	21 4	11 4	16 11	11 28	16 5						
F.	14	6 53	5 39	8 7	6 11	8 6	4 57	20 11	5 33	20 9	11 56	16 3	—	—						
M.	15	7 50	6 49	8 5	7 30	8 5	5 15	20 9	6 59	21 0	0 31	16 1	1 13	16 2						
W.	16	8 50	8 11	8 7	8 51	8 9	7 40	21 6	8 20	22 2	1 59	16 6	2 43	17 2						
Th.	17	9 54	9 28	8 11	10 0	9 2	8 53	23 0	9 23	23 10	3 23	17 11	3 58	18 9						
F.	18	10 57	10 32	9 4	11 1	9 6	9 52	24 9	10 18	25 6	4 32	19 7	5 4	20 5						
M.	19	11 58	11 29	9 9	11 56	9 10	10 43	26 3	11 9	26 8	5 33	21 1	6 1	21 7						
W.	20	0 56	—	—	0 23	10 0	11 35	27 2	11 59	27 6	6 26	22 0	6 50	22 5						
Th.	21	1 50	0 47	10 2	1 11	10 2	—	—	0 22	27 8	7 13	22 6	7 35	22 5						
F.	22	2 41	1 35	10 2	1 56	10 2	0 45	27 8	1 6	27 6	7 55	22 3	8 17	22 0						
M.	23	3 30	2 16	10 1	2 36	10 0	1 27	27 2	1 47	26 7	8 38	21 7	8 58	21 0						
W.	24	4 18	2 56	9 10	3 16	9 8	2 7	25 11	2 27	25 1	9 19	20 4	9 38	19 8						
Th.	25	5 4	3 35	9 6	3 55	9 3	2 46	24 5	3 5	23 7	9 56	18 11	10 14	18 2						
F.	26	5 51	4 15	9 1	4 35	8 10	3 25	22 8	3 46	21 9	10 32	17 5	10 52	16 8						
M.	27	6 39	4 57	8 8	5 22	8 5	4 10	21 0	4 37	20 2	11 12	15 10	11 38	15 2						
W.	28	7 27	5 51	8 2	6 27	8 0	5 10	19 6	5 49	19 1	—	—	0 10	14 8						
Th.	29	8 16	7 6	7 10	7 47	7 10	6 34	18 11	7 17	19 0	0 47	14 5	1 31	14 4						
F.	30	9 5	8 28	7 11	9 5	8 1	7 57	19 3	8 34	19 9	2 16	14 7	2 57	15 0						
M.	31	9 53	9 40	8 3	10 8	8 4	9 5	20 4	9 31	21 0	3 34	15 7	4 4	16 3						
Half Mean Spring Range.			4 ^{ft.} 10 ^{in.}		13 ^{ft.} 0 ^{in.}				10 ^{ft.} 6 ^{in.}											
Phases of the Moon.					Moon's Declination at Noon.															
D. H. M.					M.D.		° ' "		M.D.		° ' "		M.D.		° ' "		M.D.		° ' "	
Full - - - - 5 3 32 Morning.					1		21 N. 45		9		4 N. 7		17		22 S. 25		25		12 N. 7	
Last Quarter - 13 0 6 Morning.					2		22 39		10		0 E. 41		18		20 42		26		15 58	
New - - - - 19 4 2 Afternoon.					3		22 33		11		5 34		19		17 30		27		19 1	
First Quarter - 26 4 54 Afternoon.					4		21 26		12		10 18		20		13 11		28		21 11	
					5		19 23		13		14 40		21		8 8		29		22 23	
In Apogee - - 3 2 0 Afternoon.					6		16 29		14		18 23		22		2 46		30		22 35	
In Perigee - - 18 5 0 Afternoon.					7		12 52		15		21 7		23		2 N. 34		31		21 46	
In Apogee - - 30 12 0 Midnight.					8		8 42		16		22 33		24		7 36					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 GREENOCK add 19 m. LIVERPOOL add 18 m. PEMBROKE add 20 m.

BRITISH AND IRISH PORTS.

JANUARY, 1863.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	
Th.	1	3 37	29 1	4 10	29 7	7 33	12 11	8 0	13 2	8 23	9 2	8 51	9 3	11.3
F.	2	4 41	30 3	5 10	31 0	8 24	13 5	8 47	13 8	9 18	9 5	9 44	10 6	12.3
S.	3	5 34	31 9	5 57	32 3	9 5	13 10	9 24	14 1	10 4	9 1	10 23	9 10	13.3
S.	4	6 18	32 10	6 40	33 5	9 42	14 3	10 1	14 6	10 39	10 0	10 58	10 2	14.3
M.	5	6 58	33 10	7 17	34 3	10 18	14 8	10 34	14 10	11 14	10 3	11 31	10 4	15.3
Tu.	6	7 35	34 8	7 52	35 0	10 49	14 11	11 5	15 0	11 48	10 4	—	—	16.3
W.	7	8 8	35 2	8 23	35 4	11 20	15 1	11 35	15 1	0 6	10 5	0 23	10 5	17.3
Th.	8	8 39	35 4	8 55	35 4	11 53	15 1	—	—	0 39	10 5	0 57	10 4	18.3
F.	9	9 12	35 3	9 28	35 1	0 12	15 0	0 31	14 11	1 15	10 3	1 34	10 2	19.3
S.	10	9 45	34 8	10 1	34 3	0 51	14 10	1 11	14 8	1 52	10 1	2 11	10 0	20.3
S.	11	10 16	33 8	10 32	33 1	1 31	14 5	1 51	14 3	2 31	9 11	2 51	9 10	21.3
M.	12	10 49	32 5	11 9	31 7	2 13	14 0	2 36	13 9	3 12	9 8	3 35	9 7	22.3
Tu.	13	11 31	30 10	11 59	30 3	3 2	13 6	3 32	13 3	4 0	9 5	4 30	9 3	23.3
W.	14	—	—	0 31	29 9	4 5	13 1	4 42	13 0	5 2	9 2	5 35	9 1	24.3
Th.	15	1 8	29 7	1 50	29 9	5 22	13 0	6 2	13 3	6 12	9 1	6 49	9 2	25.3
F.	16	2 33	30 4	3 16	31 2	6 40	13 6	7 16	13 10	7 27	9 5	8 4	9 8	26.3
S.	17	3 58	32 2	4 36	33 6	7 49	14 3	8 19	14 9	8 40	9 10	9 13	10 2	27.3
S.	18	5 13	34 11	5 45	36 3	8 48	15 3	9 13	15 9	9 46	10 5	10 12	10 9	28.3
M.	19	6 14	37 4	6 43	38 1	9 38	16 2	10 3	16 6	10 36	11 0	10 59	11 3	29.3
Tu.	20	7 9	38 9	7 34	39 6	10 26	16 9	10 47	16 11	11 23	11 5	11 46	11 6	30.3
W.	21	7 57	39 8	8 19	39 8	11 8	17 0	11 30	16 11	—	—	0 10	11 6	31.3
Th.	22	8 39	39 6	8 59	39 2	11 52	16 10	—	—	0 39	11 5	0 55	11 4	32.3
F.	23	9 18	38 6	9 36	37 9	0 14	16 7	0 36	16 4	1 17	11 2	1 39	11 0	33.3
S.	24	9 55	36 8	10 12	35 7	0 59	15 11	1 21	15 5	2 0	10 9	2 22	10 6	34.3
S.	25	10 27	34 4	10 43	33 0	1 43	15 0	2 5	14 6	2 43	10 3	3 5	10 0	35.3
M.	26	11 0	31 8	11 19	30 5	2 27	14 0	2 50	13 6	3 26	11 1	3 48	9 5	36.3
Tu.	27	11 42	29 2	—	—	3 15	13 0	3 45	12 7	4 14	9 2	4 43	8 11	37.3
W.	28	0 11	28 1	0 46	27 3	4 19	12 3	4 58	12 0	5 15	11 8	5 50	8 6	38.3
Th.	29	1 26	26 10	2 8	26 10	5 39	11 11	6 18	12 0	6 27	11 6	7 5	8 6	39.3
F.	30	2 50	27 1	3 30	27 7	6 56	12 1	7 31	12 4	7 43	11 8	8 18	8 10	40.3
S.	31	4 8	28 5	4 41	29 4	8 1	12 8	8 27	13 0	8 52	9 0	9 20	9 2	41.3
Half Mean Spring Range.		18 ft. 7 in.				8 ft. 0 in.				5 ft. 6 in.				

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	3 45	Sub.	9	7 19	Sub.	17	10 19	Sub.	25	12 35	Sub.
2	4 13		10	7 44		18	10 39		26	12 48	
3	4 41		11	8 8		19	10 58		27	13 1	
4	5 9		12	8 31		20	11 16		28	13 12	
5	5 36		13	8 54		21	11 33		29	13 23	
6	6 2		14	9 16		22	11 50		30	13 33	
7	6 28		15	9 38		23	12 6		31	13 43	
8	6 54		16	9 59		24	12 21				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—**WESTON-SUPER-MARE** add 12 m. | **HOLYHEAD** add 10 m. | **KINGSTOWN** subtract 1 m. for Dublin Time.

FEBRUARY, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.				
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.			
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
S.	1	10 41	2 16	14 11	2 37	15 7	3 51	13 3	4 16	12 11	10 10	10 9			
M.	2	11 27	2 55	16 2	3 13	16 9	4 39	13 11	5 0	13 6	10 51	11 4			
Tu.	3	morn.	3 32	17 4	3 49	17 9	5 21	14 7	5 41	14 8	11 28	11 9			
W.	4	0 12	4 5	18 1	4 22	18 4	5 58	15 1	6 15	14 5					
Th.	5	0 56	4 38	18 7	4 53	18 9	6 33	15 4	6 50	14 11	0 18	12 3			
F.	6	1 40	5 8	18 10	5 24	18 10	7 6	15 5	7 20	14 10	0 51	12 5			
S.	7	2 25	5 41	18 9	5 57	18 8	7 36	15 4	7 52	14 9	1 25	12 6			
S.	8	3 10	6 15	18 5	6 32	18 2	8 9	15 0	8 28	14 5	1 59	12 5			
M.	9	3 58	6 51	17 9	7 10	17 2	8 45	14 5	9 1	14 1	2 33	12 3			
Tu.	10	4 48	7 32	16 7	7 55	15 11	9 18	13 11	9 39	13 7	3 11	11 10			
W.	11	5 42	8 20	15 3	8 49	14 8	10 3	13 4	10 27	13 8	3 53	11 3			
Th.	12	6 39	9 22	14 3	10 3	14 0	10 59	12 9	11 30	12 8	4 46	10 8			
F.	13	7 39	10 50	14 0	11 40	14 4			0 10	12 3	5 56	10 2			
S.	14	8 40			0 26	14 10	0 55	12 9	1 43	12 7	7 28	10 3			
S.	15	9 40	1 6	15 6	1 40	16 5	2 27	13 6	3 10	13 5	8 57	11 1			
M.	16	10 39	2 8	17 5	2 34	18 3	3 48	14 7	4 18	14 4	10 2	12 0			
Tu.	17	11 34	2 58	19 2	3 21	19 9	4 46	15 7	5 13	15 2	10 54	12 9			
W.	18	0 27	3 43	20 3	4 5	20 6	5 39	16 3	6 2	15 8	11 39	13 3			
Th.	19	1 17	4 27	20 8	4 47	20 8	6 25	16 7	6 47	16 0					
F.	20	2 6	5 6	20 7	5 26	20 4	7 9	16 7	7 26	15 11	0 44	13 5			
S.	21	2 55	5 45	19 11	6 2	19 5	7 43	16 1	8 1	15 6	1 26	13 2			
S.	22	3 43	6 20	18 10	6 38	18 2	8 18	15 4	8 36	14 9	2 3	12 10			
M.	23	4 32	6 56	17 4	7 14	16 6	8 50	14 5	9 5	13 11	2 39	12 3			
Tu.	24	5 20	7 35	15 7	7 56	14 8	9 21	13 6	9 41	13 1	3 15	11 6			
W.	25	6 10	8 18	13 10	8 43	13 2	9 58	12 5	10 19	12 3	3 54	10 8			
Th.	26	6 59	9 17	12 7	9 56	12 3	10 43	11 6	11 12	11 6	4 40	9 11			
F.	27	7 47	10 42	12 2	11 29	12 3	11 52	10 11			5 49	9 3			
S.	28	8 35			0 11	12 6	0 33	11 5	1 16	11 1	7 18	9 3			
Half Mean Spring Range.			9 ^{ft.} 6 ^{in.}				7 ^{ft.} 9 ^{in.}				6 ^{ft.}				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M. D.	°	'	M. D.	°	'	M. D.	°	'
Full - - - - -	3	10	25	Afternoon.			1	20	N. 0	9	13	8. 28	17	10	S. 30
Last Quarter -	11	10	46	Morning.			2	17	20	10	17	18	18	5	17
New - - - - -	18	3	6	Morning.			3	13	55	11	20	15	19	0	N. 7
First Quarter -	25	0	34	Afternoon.			4	9	53	12	22	3	20	5	22
							5	5	22	13	22	29	21	10	12
							6	0	35	14	21	25	22	14	24
In Perigee - -	15	11	0	Afternoon.			7	4	S. 17	15	18	55	23	17	49
In Apogee - -	27	6	0	Afternoon.			8	9	3	16	15	10	24	20	20

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be
 BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH

FEBRUARY, 1863.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's Age At Noon.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	
	1	9 33 15 5		9 55 15 11	11 29 13 9	11 50 14 0	0 31 15 9	0 57 16 1	12.8					
	2	10 15 16 4		10 36 16 9	— — — —	0 10 14 4	1 19 16 5	1 40 16 10	13.8					
	3	10 55 17 2		11 13 17 6	0 28 14 7	0 46 14 11	2 1 17 2	2 18 17 6	14.8					
	4	11 32 17 10		11 51 18 1	1 5 15 2	1 22 15 5	2 35 17 10	2 53 18 2	15.8					
	5	— — — —		0 7 18 3	1 37 15 7	1 54 15 9	3 8 18 5	3 24 18 8	16.8					
	6	0 25 18 5		0 43 18 6	2 10 15 10	2 24 15 11	3 39 18 10	3 55 19 0	17.8					
	7	1 0 18 7		1 19 18 6	2 40 15 11	2 55 15 11	4 9 19 1	4 27 19 1	18.8					
	8	1 36 18 5		1 55 18 4	3 11 15 11	3 27 15 9	4 42 19 1	4 58 19 0	19.8					
	9	2 13 18 2		2 33 17 11	3 44 15 7	4 2 15 5	5 15 18 10	5 33 18 8	20.8					
	10	2 53 17 6		3 13 17 0	4 21 15 3	4 41 14 11	5 52 18 5	6 12 18 1	21.8					
	11	3 34 16 6		3 58 16 0	5 2 14 7	5 25 14 3	6 32 17 9	6 57 17 4	22.8					
	12	4 26 15 6		4 55 15 0	5 53 13 11	6 24 13 7	7 22 17 0	7 53 16 7	23.8					
	13	5 30 14 8		6 10 14 8	7 1 13 3	7 44 13 2	8 29 16 3	9 12 16 2	24.8					
	14	6 54 14 11		7 39 15 5	8 32 13 3	9 19 13 7	9 57 16 0	10 43 16 2	25.8					
	15	8 21 15 11		8 55 16 9	10 3 14 0	10 42 14 5	11 30 16 5	— — — —	26.8					
	16	9 25 17 5		9 53 18 11	11 14 14 11	11 41 15 5	0 10 16 11	0 42 17 5	27.8					
	17	10 19 18 8		10 45 19 2	— — — —	0 7 15 10	1 11 18 0	1 37 18 6	28.8					
	18	11 9 19 7		11 33 19 10	0 31 16 3	0 54 16 7	2 2 19 0	2 25 19 5	29.8					
	19	11 56 19 11		— — — —	1 16 16 10	1 37 17 0	2 47 19 9	3 8 20 0	30.8					
	20	0 18 20 0		0 39 19 11	1 59 17 1	2 18 17 0	3 30 20 1	3 49 20 2	31.8					
	21	1 1 19 9		1 22 19 5	2 37 16 11	2 57 16 9	4 9 20 2	4 27 20 0	32.8					
	22	1 41 19 1		2 1 18 8	3 15 16 6	3 32 16 2	4 45 19 9	5 4 19 5	33.8					
	23	2 19 18 2		2 38 17 7	3 50 15 10	4 8 15 5	5 22 19 1	5 41 18 8	34.8					
	24	2 57 16 11		3 16 16 3	4 26 15 0	4 45 14 6	5 58 18 2	6 17 17 8	35.8					
	25	3 35 15 6		3 56 14 10	5 5 14 0	5 28 13 6	6 36 17 2	6 57 16 7	36.8					
	26	4 20 14 3		4 48 13 8	5 51 13 1	6 19 12 9	7 20 16 1	7 47 15 8	37.8					
	27	5 23 13 3		6 3 13 1	6 36 12 4	7 37 12 2	8 24 15 3	9 7 15 0	38.8					
	28	6 44 13 2		7 24 13 6	8 24 12 3	9 9 12 4	9 48 14 10	10 29 14 11	39.8					

Half Mean Spring } 9ft. 4in.
Range.

8ft. 0in.

9ft. 7in.

Equation of Time at Noon.

M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
1	13 51	Sub.	9	14 29	Sub.	17	14 17	Sub.	25	13 21	Sub.
2	13 59		10	14 30		18	14 12		26	13 11	
3	14 5		11	14 30		19	14 7		27	13 0	
4	14 11		12	14 30		20	14 1		28	12 49	
5	14 16		13	14 29		21	13 54				
6	14 21		14	14 27		22	13 47				
7	14 24		15	14 24		23	13 39				
8	14 27		16	14 21		24	13 30				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 Dover subtract 5 m. | SHEERNESS subtract 8 m. | LONDON 0 m.

FEBRUARY, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.																																				
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																																
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.																															
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.																													
S.	1	10 41	10	38	10	1	11	1	10	4	4	58	17	3	5	19	17	9	1	48	11	6	2	11	11																														
M.	2	11 27	11	21	10	6	11	40	10	9	5	38	18	2	5	56	18	7	2	33	12	3	2	53	12																														
Tu.	3	morn.	11	59	10	11	—	—	—	—	6	15	19	0	6	34	19	4	3	11	12	10	3	28	13																														
W.	4	0 12	0	18	11	1	0	35	11	2	6	52	19	8	7	9	20	0	3	44	13	5	4	0	13																														
Th.	5	0 56	0	50	11	3	1	6	11	4	7	25	20	3	7	41	20	5	4	17	13	11	4	32	14																														
F.	6	1 40	1	22	11	5	1	39	11	5	7	57	20	7	8	13	20	8	4	47	14	2	5	3	14																														
S.	7	2 25	1	53	11	4	2	10	11	4	8	28	20	9	8	45	20	8	5	19	14	2	5	36	14																														
S.	8	3 10	2	28	11	4	2	44	11	3	9	2	20	6	9	20	20	8	5	53	13	11	6	11	13																														
M.	9	3 58	3	2	11	1	3	20	11	0	9	38	19	11	9	57	19	6	6	29	13	6	6	50	13																														
W.	10	4 48	3	40	10	11	3	58	10	9	10	16	19	1	10	38	18	7	7	11	13	0	7	34	12																														
Tu.	11	5 42	4	18	10	6	4	39	10	4	11	2	18	2	11	33	17	7	7	57	12	3	8	25	11																														
Th.	12	6 39	5	6	10	2	5	35	10	0	—	—	—	—	0	8	17	1	8	56	11	7	9	32	11																														
F.	13	7 39	6	8	9	10	6	50	9	9	0	46	16	8	1	25	16	6	10	15	11	2	10	59	11																														
S.	14	8 40	7	40	9	10	8	27	10	0	2	8	16	7	2	50	16	11	11	44	11	4	—	—	—																														
S.	15	9 40	9	10	10	3	9	49	10	6	3	31	17	7	4	11	18	4	0	23	11	9	1	1	12																														
M.	16	10 39	10	23	10	11	10	52	11	3	4	43	19	1	5	10	19	10	1	33	12	10	2	3	13																														
Tu.	17	11 34	11	18	11	7	11	44	11	10	5	35	20	6	6	0	21	1	2	30	13	11	2	56	14																														
W.	18	0 27	—	—	—	—	0	7	12	0	6	24	21	6	6	46	21	10	3	19	14	8	3	39	15																														
Th.	19	1 17	0	29	12	1	0	49	12	2	7	8	22	1	7	30	22	3	4	0	15	3	4	21	15																														
F.	20	2 6	1	11	12	2	1	32	12	2	7	51	22	3	8	11	22	2	4	41	15	5	5	0	15																														
S.	21	2 55	1	52	12	1	2	12	11	11	8	30	22	0	8	49	21	7	5	20	15	2	5	39	14																														
S.	22	3 43	2	31	11	9	2	49	11	6	9	7	21	1	9	26	20	6	5	58	14	5	6	17	13																														
M.	23	4 32	3	8	11	3	3	26	11	0	9	44	19	10	10	2	19	2	6	35	13	6	6	55	13																														
Tu.	24	5 20	3	44	10	9	4	2	10	5	10	20	18	6	10	41	17	9	7	16	12	7	7	37	12																														
W.	25	6 10	4	21	10	2	4	41	9	10	11	6	17	0	11	33	16	4	8	0	11	6	8	23	11																														
Th.	26	6 59	5	4	9	7	5	29	9	5	—	—	—	—	0	4	15	10	8	51	10	8	9	27	10																														
F.	27	7 47	6	3	9	3	6	44	9	1	0	41	15	3	1	19	15	0	10	8	10	1	10	52	10																														
S.	28	8 35	7	32	9	2	8	17	9	3	2	0	14	11	2	41	15	1	11	34	10	1	—	—	—																														
Half Mean Spring Range.			5 ft. 9 in.								10 ft. 5 in.								7 ft. 2 in.																																				
Phases of the Moon.																												Moon's Declination at Noon.																											
D. H. M.																												M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'																
Full - - - - -																												3	10	25	Afternoon.	1	20	N. 0	9	13	S. 28	17	10	S. 30	25	21	N.												
Last Quarter -																												11	10	46	Morning.	2	17	20	10	17	18	18	5	17	26	23													
New - - - - -																												18	3	6	Morning.	3	13	55	11	20	15	19	0	N. 7	27	21													
First Quarter																												25	0	34	Afternoon.	4	9	53	12	22	3	20	5	22	28	20													
																												5	5	22		5	5	22	13	22	29	21	10	12															
In Perigee - -																												15	11	0	Afternoon.	6	0	35	14	21	25	22	14	24															
In Apogee - -																												27	6	0	Afternoon.	7	4	S. 17	15	18	55	23	17	49															
																												8	9	3		8	9	3	16	15	10	24	20	20															

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

FEBRUARY, 1863.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C'S AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. L. F.	D.								
P.	1	1 58	10 4	2 18	10 8	0 52	13 0	1 12	13 5	7 12	10 3	7 29	10 9	12.8												
M.	2	2 37	11 0	2 55	11 5	1 32	13 10	1 51	14 4	7 44	11 2	8 0	11 8	13.8												
Tu.	3	3 12	11 9	3 29	12 1	2 9	14 9	2 27	15 1	8 16	12 1	8 32	12 5	○												
W.	4	3 45	12 4	4 1	12 7	2 44	15 5	2 59	15 8	8 47	12 8	9 2	12 10	15.8												
Th.	5	4 17	12 9	4 33	12 11	3 14	15 10	3 29	15 11	9 17	12 11	9 33	13 0	16.8												
F.	6	4 49	13 0	5 6	13 0	3 44	16 0	4 0	16 0	9 50	13 0	10 6	12 11	17.8												
S.	7	5 22	12 11	5 39	12 10	4 16	15 11	4 33	15 10	10 24	12 10	10 41	12 9	18.8												
P.	8	5 56	12 9	6 15	12 7	4 51	15 9	5 9	15 7	11 0	12 6	11 19	12 3	19.8												
M.	9	6 34	12 5	6 53	12 3	5 27	15 5	5 48	15 2	11 40	11 11	—	—	20.8												
Tu.	10	7 13	11 11	7 35	11 7	6 9	14 10	6 32	14 5	0 1	11 7	0 23	11 3	21.8												
W.	11	8 1	11 2	8 31	10 9	6 56	14 0	7 25	13 7	0 48	10 10	1 17	10 5	⊕												
Th.	12	9 4	10 4	9 43	10 2	7 59	13 2	8 36	12 10	1 49	10 1	2 27	9 10	23.8												
F.	13	10 27	10 1	11 11	10 2	9 20	12 9	10 6	12 9	3 12	9 8	4 3	9 8	24.8												
S.	14	11 57	10 5	—	—	10 50	13 0	11 30	13 5	4 50	9 9	5 32	10 0	25.8												
P.	15	0 37	10 9	1 14	11 2	—	—	0 8	13 11	6 10	10 7	6 38	11 2	26.8												
M.	16	1 43	11 8	2 9	12 2	0 37	14 5	1 3	15 1	7 3	11 11	7 25	12 7	27.8												
Tu.	17	2 34	12 9	2 57	13 3	1 29	15 9	1 54	16 4	7 45	13 3	8 6	13 9	28.8												
W.	18	3 19	13 7	3 39	13 11	2 16	16 9	2 38	17 2	8 26	14 2	8 46	14 4	●												
Th.	19	4 0	14 2	4 22	14 3	2 58	17 4	3 18	17 5	9 6	14 5	9 26	14 4	1.4												
F.	20	4 42	14 3	5 2	14 1	3 38	17 4	3 58	17 2	9 47	14 2	10 8	13 11	2.4												
S.	21	5 23	13 10	5 43	13 6	4 18	16 11	4 37	16 7	10 27	13 7	10 46	13 2	3.4												
P.	22	6 2	13 2	6 21	12 10	4 56	16 3	5 15	15 10	11 6	12 9	11 25	12 3	4.4												
M.	23	6 39	12 5	6 58	12 0	5 34	15 5	5 54	14 11	11 46	11 8	—	—	5.4												
Tu.	24	7 17	11 6	7 39	11 0	6 14	14 4	6 36	13 9	0 6	11 2	0 27	10 7	6.4												
W.	25	8 4	10 4	8 30	9 10	6 59	13 1	7 25	12 7	0 51	10 0	1 15	9 6	⊕												
Th.	26	9 0	9 5	9 38	9 2	7 54	12 2	8 31	11 9	1 45	9 1	2 22	8 8	8.4												
F.	27	10 20	9 0	11 4	9 0	9 13	11 6	9 59	11 5	3 6	8 5	3 55	8 4	9.4												
S.	28	11 47	9 1	—	—	10 40	11 7	11 18	11 9	4 40	8 4	5 19	8 6	10.4												
Half Mean Spring Range.		6ft. 8in.								8ft. 2in.								6ft. 7in.								

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	13	51	Sub.	9	14	29	Sub.	17	14	17	Sub.	25	13	21	Sub.
2	13	59		10	14	30		18	14	12		26	13	11	
3	14	5		11	14	30		19	14	7		27	13	0	
4	14	11		12	14	30		20	14	1		28	12	49	
5	14	16		13	14	29		21	13	54					
6	14	21		14	14	27		22	13	47					
7	14	24		15	14	24		23	13	39					
8	14	27		16	14	21		24	13	30					

The times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

FEBRUARY, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
☾	1	10 24	10 31	8 6	10 52	8 8	9 52	21 7	10 12	22 3	4 29	16 10	4 53	17 3	
M.	2	11 27	11 12	8 9	11 33	8 11	10 30	22 10	10 47	23 4	5 17	18 0	5 38	18 4	
Tu.	3	morn.	11 53	9 1	—	—	11 6	23 10	11 23	24 11	5 57	19 0	6 15	19 6	
W.	4	0 12	0 11	9 2	0 28	9 4	11 40	24 9	11 57	25 2	6 32	19 11	6 48	20 9	
Th.	5	0 56	0 45	9 6	1 1	9 7	—	—	0 13	25 5	7 4	20 6	7 19	20 1	
F.	6	1 40	1 18	9 8	1 35	9 8	0 29	25 8	0 46	25 9	7 35	20 9	7 51	20 9	
S.	7	2 25	1 50	9 9	2 7	9 9	1 2	25 10	1 18	25 8	8 7	20 8	8 24	20 7	
☾	8	3 10	2 24	9 8	2 41	9 8	1 34	25 6	1 51	25 2	8 42	20 4	9 0	20 1	
M.	9	3 58	2 58	9 7	3 17	9 5	2 8	24 9	2 27	24 4	9 19	19 8	9 37	19 4	
Tu.	10	4 48	3 35	9 4	3 55	9 2	2 46	23 9	3 5	23 11	9 55	18 7	10 15	18 2	
W.	11	5 42	4 17	9 1	4 42	8 11	3 28	22 7	3 53	21 10	10 39	17 5	11 4	16 9	
Th.	12	6 39	5 10	8 8	5 43	8 6	4 24	21 2	5 0	20 7	11 31	16 2	—	—	
F.	13	7 39	6 22	8 4	7 6	8 3	5 44	20 4	6 34	20 5	0 6	15 11	0 47	15 9	
S.	14	8 40	7 53	8 4	8 38	8 6	7 23	20 10	8 6	21 6	1 38	16 0	2 28	16 7	
☾	15	9 40	9 19	8 9	9 53	9 0	8 46	22 5	9 16	23 4	3 12	17 4	3 48	18 4	
M.	16	10 39	10 23	9 3	10 50	9 6	9 43	24 4	10 9	25 3	4 22	19 3	4 52	20 2	
Tu.	17	11 34	11 16	9 8	11 42	9 10	10 33	26 1	10 56	26 8	5 20	20 11	5 47	21 6	
W.	18	0 27	—	—	0 5	10 0	11 18	27 2	11 40	27 7	6 9	22 0	6 31	22 4	
Th.	19	1 17	0 28	10 1	0 50	10 2	—	—	0 22	27 9	6 53	22 7	7 13	22 1	
F.	20	2 6	1 11	10 3	1 32	10 3	0 22	27 10	0 42	27 9	7 33	22 6	7 53	22 3	
S.	21	2 55	1 52	10 2	2 11	10 1	1 3	27 5	1 21	26 11	8 11	21 10	8 29	21 3	
☾	22	3 43	2 28	9 11	2 47	9 9	1 38	26 3	1 56	25 6	8 48	20 8	9 6	20 0	
M.	23	4 32	3 4	9 7	3 21	9 4	2 14	24 9	2 32	23 11	9 24	19 3	9 41	18 6	
Tu.	24	5 20	3 38	9 2	3 58	8 11	2 50	23 0	3 9	22 1	9 58	17 8	10 16	16 10	
W.	25	6 10	4 18	8 8	4 40	8 5	3 29	21 1	3 51	20 3	10 36	16 0	10 56	15 3	
Th.	26	6 59	5 5	8 3	5 37	8 0	4 19	19 5	4 55	18 9	11 24	14 6	11 59	14 1	
F.	27	7 47	6 15	7 10	6 59	7 8	5 37	18 4	6 26	18 3	—	—	0 40	13 13	
S.	28	8 35	7 43	7 8	8 23	7 10	7 13	18 6	7 52	18 10	1 26	13 11	2 11	14 2	
Half Moon Spring } Range.			4 ft. 10 in.				13 ft. 0 in.				10 ft. 6 in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'
Full - - - - -	3	10	25	Afternoon.	1	20	N.	0	9	13	8. 28	17	10	8. 30	
Last Quarter -	11	10	46	Morning.	2	17	20	10	17	18	18	5	17		
New - - - - -	18	3	6	Morning.	3	13	55	11	20	15	19	0	N. 7		
First Quarter	25	0	34	Afternoon.	4	9	53	12	22	3	20	5	22		
					5	5	22	13	22	29	21	10	12		
In Perigee - -	15	11	0	Afternoon.	6	0	35	14	21	25	22	14	24		
In Apogee - -	27	6	0	Afternoon.	7	4	8. 17	15	18	55	23	17	49		
					8	9	3	16	15	10	24	20	20		

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —

GREENOCK add 19 m.

†

LIVERPOOL add 18 m.

|

PEMBROKE add 20 m.

FEBRUARY, 1863.

MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
	Time. H. M. P. E.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	D.								
1	5 8 30	4	5 33 31	8 48 13	5	9 7 13	9 9 44	9 5	10 6 9	7	12 8							12.8							
2	5 56 32	3	6 18 33	9 25 14	1	9 42 14	10 24 9	10	10 41 10	0	13 8							13.8							
3	6 38 34	0	6 57 34	10 0 14	9	10 17 15	10 58 10	3	11 14 10	5	15 8							15.8							
4	7 15 35	4	7 32 35	11 10 15	3	10 47 15	11 29 10	7	11 45 10	8	16 8							16.8							
5	7 48 36	6	8 3 36	11 1 15	8	11 15 15	—	—	0 1 10	9	17 8							17.8							
6	8 19 36	11	8 34 37	11 30 15	10	11 46 15	10 17 10	9	0 34 10	9	18 8							18.8							
7	8 50 37	0	9 6 36	—	—	0 4 15	9 0 50	10 9	1 7 10	9															
8	9 22 36	6	9 38 36	0 22 15	8	0 41 15	6 1 25	10 8	1 44 10	6	19 8							19.8							
9	9 55 35	6	10 11 34	1 1 15	3	1 22 15	0 2 2 10	4	2 22 10	2	20 8							20.8							
10	10 27 33	9	10 44 32	1 43 14	8	2 5 14	3 2 43	10 0	3 5 9	10	21 8							21.8							
11	11 6 31	9	11 31 30	2 29 13	11	2 58 13	6 3 29	9 8	3 56 9	5	22 8							22.8							
12	—	—	0 3 29	3 30 13	2	4 8 12	10 4 29	9 2	5 6 9	0	23 8							23.8							
13	0 41 29	2	1 26 29	4 53 12	9	5 39 12	10 5 45	8 11	6 28 9	0	24 8							24.8							
14	2 14 29	5	3 0 30	6 24 13	1	7 4 13	5 7 11	9 2	7 51 9	5	25 8							25.8							
15	3 45 31	5	4 26 32	7 42 13	11	8 12 14	6 8 31	9 8	9 5 10	0	26 8							26.8							
16	5 1 34	4	5 33 35	8 39 15	1	9 4 15	7 9 36	10 4	10 3 10	8	27 8							27.8							
17	6 1 37	1	6 28 38	9 27 16	1	9 50 16	10 26 10	11	10 47 11	2	28 8							28.8							
18	6 51 38	9	7 14 39	10 11 16	9	10 31 16	11 11 7	11 4	11 28 11	6															
19	7 37 39	10	7 57 39	11 50 17	1	11 9 17	11 49 11	7	—	—	1 4							1.4							
20	8 17 39	9	8 36 39	11 28 17	0	11 48 16	9 0 10	11 6	0 31 11	5	2 4							2.4							
21	8 54 38	9	9 10 38	—	—	0 8 16	6 0 52	11 4	1 11 11	2	3 4							3.4							
22	9 27 37	2	9 43 36	0 27 16	2	0 47 15	8 1 30	10 11	1 49 10	8	4 4							4.4							
23	9 59 34	10	10 13 33	1 7 15	3	1 27 14	8 2 8	10 4	2 28 10	1	5 4							5.4							
24	10 28 32	2	10 44 30	1 47 14	2	2 9 13	7 2 47	9 9	3 8 9	6	6 4							6.4							
25	11 3 29	5	11 26 28	2 32 13	1	2 56 12	7 3 31	9 2	3 55 8	11	7 4							7.4							
26	11 57 27	1	—	3 26 12	1	4 3 11	9 4 24	8 8	5 1 8	5	8 4							8.4							
27	0 35 26	3	1 18 26	4 46 11	6	5 32 11	6 5 39	8 3	6 21 8	3	9 4							9.4							
28	2 4 26	1	2 45 26	6 14 11	8	6 52 11	7 1 8	4	7 39 8	6	10 4							10.4							
Half Mean Spring Range.				18 ft. 7 in.				8 ft. 0 in.				5 ft. 6 in.													

Equation of Time at Noon.

D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	13	51	Sub.	9	14	29	Sub.	17	14	17	Sub.	25	13	21	Sub.
2	13	59		10	14	30		18	14	12		26	13	11	
3	14	5		11	14	30		19	14	7		27	13	0	
4	14	11		12	14	30		20	14	1		28	12	49	
5	14	16		13	14	29		21	13	54					
6	14	21		14	14	27		22	13	47					
7	14	24		15	14	24		23	13	39					
8	14	27		16	14	21		24	13	30					

times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 12 m. | KINGSTOWN subtract 1 m. for Dublin Time.

FEBRUARY, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.
S.	1	10 41	9 23	8 5	9 42	8 7	6 32	6 4	6 52	6 6	3 52	9 0	4 9	
M.	2	11 27	10 0	8 9	10 18	8 11	7 11	6 8	7 30	6 10	4 26	9 8	4 44	
Tu.	3	MORN.	10 36	9 0	10 52	9 2	7 50	7 0	8 7	7 2	5 2	10 3	5 20	
W.	4	0 12	11 8	9 3	11 24	9 3	8 22	7 4	8 37	7 6	5 37	10 9	5 53	
Th.	5	0 56	11 39	9 4	11 54	9 4	8 52	7 7	9 5	7 7	6 9	11 0	6 23	
F.	6	1 40	—	—	0 9	9 4	9 20	7 6	9 35	7 6	6 39	11 0	6 55	
S.	7	2 25	0 25	9 4	0 43	9 4	9 51	7 5	10 7	7 4	7 12	10 10	7 30	
S.	8	3 10	1 1	9 4	1 20	9 3	10 23	7 2	10 41	7 1	7 47	10 6	8 5	
M.	9	3 58	1 40	9 2	2 0	9 1	11 1	6 11	11 22	6 8	8 24	10 0	8 44	
Tu.	10	4 48	2 23	9 0	2 47	8 10	11 49	6 5	—	—	9 6	9 6	9 33	
W.	11	5 42	3 12	8 8	3 40	8 6	0 19	6 2	0 55	5 11	10 4	8 11	10 39	
Th.	12	6 39	4 11	8 4	4 47	8 3	1 35	5 9	2 20	5 8	11 18	8 6	12 0	
F.	13	7 39	5 27	8 2	6 9	8 1	3 4	5 9	3 47	5 11	—	—	0 43	
S.	14	8 40	6 55	8 1	7 38	8 3	4 27	6 2	5 1	6 5	1 29	8 8	2 10	
S.	15	9 40	8 16	8 6	8 46	8 9	5 32	6 8	5 58	6 11	2 49	9 4	3 17	
M.	16	10 39	9 13	9 0	9 39	9 3	6 23	7 3	6 49	7 6	3 43	10 3	4 6	
Tu.	17	11 34	10 3	9 6	10 26	9 8	7 15	7 9	7 39	7 11	4 29	11 2	4 52	
W.	18	0 27	10 47	9 9	11 7	9 10	8 1	8 1	8 21	8 3	5 14	11 9	5 37	
Th.	19	1 17	11 28	9 10	11 47	9 10	8 41	8 4	9 0	8 3	5 58	12 1	6 17	
F.	20	2 6	—	—	0 6	9 9	9 18	8 2	9 37	8 0	6 36	11 11	6 56	
S.	21	2 55	0 26	9 9	0 47	9 8	9 55	7 10	10 11	7 7	7 16	11 5	7 34	
S.	22	3 43	1 6	9 6	1 26	9 4	10 29	7 4	10 47	7 1	7 53	10 8	8 11	
M.	23	4 32	1 46	9 2	2 7	9 0	11 6	6 9	11 28	6 5	8 29	9 10	8 48	
Tu.	24	5 20	2 28	8 10	2 51	8 7	11 55	6 1	—	—	9 10	9 0	9 37	
W.	25	6 10	3 14	8 4	3 38	8 2	0 24	5 8	0 56	5 5	10 4	8 3	10 35	
Th.	26	6 59	4 6	8 0	4 42	7 10	1 31	5 3	2 15	5 1	11 13	7 9	11 53	
F.	27	7 47	5 20	7 9	6 2	7 8	2 58	5 1	3 40	5 3	—	—	0 36	
S.	28	8 35	6 45	7 8	7 24	7 8	4 19	5 5	4 52	5 8	1 19	7 8	1 57	

Half Mean Spring }
Range.

4 ft. 9 in.

3 ft. 10 in.

5 ft. 7 in.

Phases of the Moon.

	D.	H.	M.	
Full - - - - -	3	10	25	Afternoon.
Last Quarter -	11	10	46	Morning.
New - - - - -	18	3	6	Morning.
First Quarter	25	0	34	Afternoon.
In Perigee - -	15	11	0	Afternoon.
In Apogee - -	27	6	0	Afternoon.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	20	N.	0	9	13	8.	28	17	10	8.	30
2	17	20	10	17	18	18	5	17	26	2	20
3	13	55	11	20	15	19	0	N.	7	27	2
4	9	53	12	22	3	20	5	23	28	2	20
5	5	22	13	22	29	21	10	12			
6	0	35	14	21	25	22	14	24			
7	4	8.	17	15	18	23	17	49			
8	9	3	16	15	10	24	20	20			

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required
 BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

FEBRUARY, 1863.

GALWAY.										QUEENSTOWN.										WATERFORD.										C's Age at Noon.
MORNING.					AFTERNOON.					MORNING.					AFTERNOON.					MORNING.					AFTERNOON.					
Time.	Height.				Time.	Height.				Time.	Height.				Time.	Height.				Time.	Height.				Time.	Height.				
L. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	L. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	L. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	L. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	L. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	D.					
3 6 11 8	3 28 12 1	3 23 9 7	3 46 9 11	3 38 10 5	4 2 10 8	12.8																								
3 46 12 6	4 4 12 11	4 7 10 3	4 27 10 6	4 25 11 0	4 47 11 3	13.8																								
4 23 13 3	4 40 13 7	4 46 10 9	5 3 11 0	5 8 11 6	5 26 11 8	0																			○					
4 55 13 11	5 11 14 3	5 20 11 3	5 37 11 5	5 43 11 10	5 58 12 0	15.8																								
5 27 14 5	5 43 14 7	5 54 11 6	6 10 11 7	6 14 12 2	6 31 12 3	16.8																								
6 0 14 8	6 17 14 8	6 27 11 8	6 43 11 8	6 48 12 4	7 4 12 4	17.8																								
6 34 14 7	6 50 14 5	7 0 11 8	7 16 11 6	7 21 12 5	7 37 12 4	18.8																								
7 8 14 3	7 27 14 0	7 33 11 5	7 51 11 3	7 54 12 3	8 11 12 2	19.8																								
7 47 13 9	8 8 13 4	8 10 11 1	8 28 10 10	8 29 12 0	8 46 11 9	20.8																								
8 30 12 11	8 53 12 5	8 46 10 6	9 6 10 3	9 3 11 6	9 22 11 3	21.8																								
9 20 11 10	9 50 11 5	9 31 9 11	9 56 9 8	9 45 10 11	10 13 10 7	22.8																			☾					
0 26 11 1	11 8 11 0	10 27 9 5	11 7 9 3	10 49 10 3	11 27 10 1	23.8																								
1 55 11 1	— —	11 52 9 3	— —	— —	0 9 10 0	24.8																								
0 41 11 4	1 22 11 9	0 39 9 4	1 24 9 8	0 52 10 1	1 34 10 4	25.8																								
2 0 12 4	2 29 12 11	2 8 10 0	2 44 10 4	2 17 10 9	2 56 11 2	26.8																								
2 58 13 6	3 25 14 1	3 16 10 10	3 44 11 3	3 31 11 7	4 2 12 0	27.8																								
3 49 14 8	4 12 15 1	4 10 11 8	4 34 12 0	4 30 12 5	4 58 12 8	28.8																								
4 34 15 6	4 54 15 10	4 57 12 3	5 20 12 5	5 20 12 11	5 42 13 1	29.8																			●					
5 16 16 0	5 37 16 0	5 43 12 7	6 4 12 7	6 3 13 2	6 24 13 3	30.4																								
5 57 15 11	6 18 15 9	6 24 12 6	6 44 12 5	6 44 13 2	7 5 13 1	31.4																								
6 37 15 5	6 55 15 0	7 3 12 2	7 21 11 11	7 25 12 11	7 42 12 9	32.4																								
7 15 14 6	7 33 14 0	7 39 11 7	7 57 11 3	8 0 12 6	8 16 12 2	33.4																								
7 53 13 5	8 12 12 10	8 14 10 10	8 30 10 6	8 33 11 10	8 49 11 6	34.4																								
8 33 12 2	8 55 11 5	8 48 10 0	9 8 9 7	9 5 11 1	9 22 10 8	35.4																								
9 18 10 10	9 45 10 4	9 28 9 3	9 50 8 11	9 42 10 3	10 8 9 10	36.4																			☽					
0 21 9 11	11 1 9 8	10 21 8 7	11 0 8 4	10 44 9 6	11 21 9 2	37.4																								
1 47 9 8	— —	11 44 8 3	— —	— —	0 2 9 0	38.4																								
0 31 9 9	1 9 10 0	0 29 8 4	1 9 8 6	0 42 9 1	1 20 9 3	39.4																								
Mean Spring } 7ft. 5in.					5ft. 10in.					6ft. 2in.																				
Range.																														

Equation of Time at Noon.

M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
13 51		9	14 29		17	14 17		25	13 21	
13 59		10	14 30		18	14 12		26	13 11	
14 5		11	14 30		19	14 7		27	13 0	
14 11		12	14 30		20	14 1		28	12 49	
14 16		13	14 29		21	13 54				
14 21		14	14 27		22	13 47				
14 24		15	14 24		23	13 39				
14 27		16	14 21		24	13 30				

of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 8 m.

MARCH, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMO																						
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				A																		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																					
			H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.																						
M.	1	9 52	0 48	13 0	1 22	13 8	1 56	12 1	2 35	11 8	8 37	9 9	9 9	9 9	9 9	9 9	9 9	9 9	9 9																						
Tu.	2	10 7	1 47	14 5	2 9	15 2	3 10	12 11	3 41	12 7	9 38	10 6	10 6	10 6	10 6	10 6	10 6	10 6	10 6																						
W.	3	10 52	2 28	15 11	2 47	16 8	4 6	13 10	4 30	13 5	10 23	11 3	11 3	11 3	11 3	11 3	11 3	11 3	11 3																						
Th.	4	11 37	3 3	17 5	3 20	18 0	4 52	14 7	5 12	14 2	10 59	11 11	11 11	11 11	11 11	11 11	11 11	11 11	11 11																						
F.	5	morn.	3 37	18 6	3 53	18 11	5 31	15 2	5 49	14 9	11 33	12 4	12 4	12 4	12 4	12 4	12 4	12 4	12 4																						
S.	6	0 25	4 9	19 2	4 27	19 5	6 6	15 7	6 25	15 2	—	—	—	—	—	—	—	—	—																						
S.	7	1 7	4 43	19 7	4 59	19 8	6 43	15 10	7 0	15 6	0 23	12 10	12 10	12 10	12 10	12 10	12 10	12 10	12 10																						
M.	8	1 55	5 16	19 7	5 34	19 4	7 14	15 8	7 30	15 5	0 59	12 11	12 11	12 11	12 11	12 11	12 11	12 11	12 11																						
Tu.	9	2 45	5 51	19 2	6 11	18 9	7 47	15 4	8 5	15 1	1 34	12 9	12 9	12 9	12 9	12 9	12 9	12 9	12 9																						
W.	10	3 39	6 29	18 4	6 50	17 8	8 24	14 11	8 43	14 8	2 11	12 6	12 6	12 6	12 6	12 6	12 6	12 6	12 6																						
Th.	11	4 35	7 13	17 0	7 39	16 2	9 3	14 2	9 23	14 1	2 51	12 0	12 0	12 0	12 0	12 0	12 0	12 0	12 0																						
F.	12	5 33	8 5	15 5	8 35	14 8	9 47	13 6	10 13	13 5	3 38	11 5	11 5	11 5	11 5	11 5	11 5	11 5	11 5																						
S.	13	6 32	9 11	14 3	9 53	14 0	10 42	12 8	11 18	12 10	4 32	10 8	10 8	10 8	10 8	10 8	10 8	10 8	10 8																						
S.	14	7 31	10 41	14 0	11 31	14 3	12 0	12 2	—	—	5 46	10 2	10 2	10 2	10 2	10 2	10 2	10 2	10 2																						
M.	15	8 28	—	—	0 15	14 9	0 47	12 11	1 34	12 6	7 20	10 3	10 3	10 3	10 3	10 3	10 3	10 3	10 3																						
Tu.	16	9 23	0 55	15 6	1 27	16 4	2 18	13 7	2 58	13 5	8 45	11 1	11 1	11 1	11 1	11 1	11 1	11 1	11 1																						
W.	17	10 15	1 53	17 2	2 19	18 1	3 34	14 7	4 3	14 3	9 47	11 11	11 11	11 11	11 11	11 11	11 11	11 11	11 11																						
Th.	18	11 6	2 40	18 9	3 2	19 5	4 30	15 5	4 54	15 1	10 36	12 7	12 7	12 7	12 7	12 7	12 7	12 7	12 7																						
F.	19	11 55	3 22	19 11	3 42	20 2	5 18	16 0	5 39	15 8	11 18	13 1	13 1	13 1	13 1	13 1	13 1	13 1	13 1																						
S.	20	0 24	4 120	3	4 22	20 3	6 0	16 4	6 21	16 0	11 58	13 3	13 3	13 3	13 3	13 3	13 3	13 3	13 3																						
S.	21	1 32	4 41	20 1	4 58	19 10	6 40	16 2	6 59	15 9	0 18	13 3	13 3	13 3	13 3	13 3	13 3	13 3	13 3																						
M.	22	2 22	5 16	19 6	5 34	19 0	7 13	15 8	7 29	15 4	0 58	13 0	13 0	13 0	13 0	13 0	13 0	13 0	13 0																						
Tu.	23	3 11	5 50	18 6	6 8	17 11	7 46	15 1	8 2	14 9	1 34	12 7	12 7	12 7	12 7	12 7	12 7	12 7	12 7																						
W.	24	4 1	6 26	17 3	6 43	16 6	8 19	14 3	8 34	14 0	2 9	12 1	12 1	12 1	12 1	12 1	12 1	12 1	12 1																						
Th.	25	4 51	7 2	15 8	7 23	14 10	8 49	13 4	9 5	13 3	2 44	11 5	11 5	11 5	11 5	11 5	11 5	11 5	11 5																						
F.	26	5 40	7 45	14 1	8 10	13 5	9 24	12 5	9 43	12 5	3 23	10 9	10 9	10 9	10 9	10 9	10 9	10 9	10 9																						
S.	27	6 28	8 39	12 10	9 12	12 5	10 5	11 6	10 35	11 9	4 7	10 1	10 1	10 1	10 1	10 1	10 1	10 1	10 1																						
S.	28	7 14	9 51	12 3	10 36	12 3	11 5	10 10	11 46	11 6	5 6	9 5	9 5	9 5	9 5	9 5	9 5	9 5	9 5																						
M.	29	8 0	11 19	12 6	11 59	12 11	—	—	0 30	10 11	6 26	9 3	9 3	9 3	9 3	9 3	9 3	9 3	9 3																						
Tu.	30	8 45	—	—	0 34	13 6	1 10	12 0	1 49	11 8	7 46	9 8	9 8	9 8	9 8	9 8	9 8	9 8	9 8																						
W.	31	9 30	1 4	14 2	1 31	14 11	2 28	13 9	2 58	12 6	8 54	10 5	10 5	10 5	10 5	10 5	10 5	10 5	10 5																						
Half Mean Spring Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.																						
Phases of the Moon.																					Moon's Declination at Noon.																				
D. H. M.																					M.D. ° ' "																				
Full - - - - - 5 2 46 Afternoon.																					1 18 N. 6 9 16 8. 16 17 78. 15 2.																				
Last Quarter - 12 6 55 Afternoon.																					2 14 57 10 19 26 18 2 2 20																				
New - - - - - 19 2 37 Afternoon.																					3 11 7 11 21 29 19 3 N. 13 27																				
First Quarter - 27 8 58 Morning.																					4 6 46 12 22 15 20 8 12 28																				
																					5 2 2 13 21 36 21 12 39 20																				
In Perigee - 15 7 0 Morning.																					6 2 52 14 19 35 22 16 24 30																				
In Apogee - 27 2 0 Afternoon.																					7 7 43 15 16 20 23 19 17 3																				
																					8 12 16 16 12 7 24 21 11																				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be re

Brest add 12 m.

Devonport add 17 m.

Portsmouth add 4

BRITISH AND IRISH PORTS.

I

MARCH, 1863.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's Acc. at Noon.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	
M.	1	8 3 13	11	8 38 14	6	9 49 12	7	10 25 13	0	11 12 15	0	11 50 15	4	11' 4
Tu.	2	9 2 15	1	9 24 15	8	10 58 13	4	11 22 13	9	—	—	0 24 15	9	12' 4
W.	3	9 46 16	3	10 6 16	9	11 42 14	2	—	—	0 50 16	2	1 11 16	7	13' 4
Th.	4	10 25 17	3	10 44 17	9	0 1 14	7	0 19 14	11	1 32 17	1	1 51 17	6	14' 4
F.	5	11 1 18	1	11 20 18	5	0 36 15	3	0 53 15	6	2 8 17	11	2 25 18	3	15' 4
S.	6	11 38 18	9	11 56 18	11	1 10 15	10	1 26 16	1	2 41 18	8	2 57 18	11	16' 4
	7	—	—	0 14 19	1	1 41 16	3	1 58 16	4	3 13 19	2	3 29 19	4	17' 4
M.	8	0 33 19	2	0 51 19	2	2 13 16	4	2 30 16	4	3 43 19	6	4 0 19	7	18' 4
Tu.	9	1 11 19	0	1 31 18	10	2 47 16	4	3 4 16	3	4 17 19	6	4 37 19	5	19' 4
W.	10	1 51 18	7	2 11 18	3	3 21 16	1	3 40 15	10	4 54 19	3	5 12 19	1	20' 4
Th.	11	2 32 17	10	2 55 17	4	3 59 15	6	4 20 15	2	5 31 18	9	5 52 18	5	21' 4
F.	12	3 19 16	9	3 44 16	2	4 44 14	9	5 9 14	4	6 15 18	0	6 39 17	6	22' 4
S.	13	4 13 15	7	4 44 15	0	5 37 14	0	6 10 13	7	7 7 17	1	7 39 16	8	23' 4
	14	5 21 14	8	6 2 14	7	6 49 13	3	7 33 13	2	8 16 16	4	9 0 16	1	24' 4
M.	15	6 45 14	10	7 28 15	4	8 23 13	3	9 11 13	6	9 48 16	0	10 34 16	2	25' 4
Tu.	16	8 10 16	0	8 42 16	8	9 52 13	11	10 30 14	5	11 20 16	5	11 59 16	11	26' 4
W.	17	9 10 17	4	9 37 17	11	11 1 14	10	11 27 15	4	—	—	0 29 17	4	27' 4
Th.	18	10 1 18	6	10 24 18	11	11 52 15	9	—	—	0 55 17	10	1 20 18	5	28' 4
F.	19	10 46 19	3	11 8 19	6	0 13 16	1	0 35 16	5	1 45 18	10	2 5 19	2	29' 4
S.	20	11 30 19	7	11 51 19	8	0 55 16	7	1 15 16	9	2 25 19	6	2 46 19	9	30' 4
	21	—	—	0 13 19	6	1 33 16	10	1 54 16	9	3 4 19	10	3 23 19	11	31' 4
M.	22	0 32 19	4	0 51 19	1	2 12 16	8	2 30 16	6	3 41 19	10	3 59 19	8	32' 4
Tu.	23	1 11 18	9	1 30 18	4	2 47 16	3	3 4 16	0	4 17 19	6	4 34 19	3	33' 4
W.	24	1 48 17	11	2 7 17	5	3 20 15	8	3 37 15	4	4 52 18	10	5 8 18	6	34' 4
Th.	25	2 25 16	10	2 44 16	3	3 56 14	11	4 13 14	6	5 26 18	1	5 45 17	8	35' 4
F.	26	3 4 15	8	3 24 15	1	4 33 14	0	4 53 13	7	6 5 17	2	6 24 16	8	36' 4
S.	27	3 48 14	7	4 14 14	0	5 17 13	3	5 44 12	10	6 47 16	3	7 14 15	10	37' 4
	28	4 43 13	6	5 17 13	3	6 15 12	6	6 51 12	3	7 42 15	6	8 19 15	3	38' 4
M.	29	5 55 13	2	6 34 13	5	7 32 12	2	8 18 12	3	9 2 15	0	9 44 14	11	39' 4
Tu.	30	7 12 13	9	7 48 14	4	8 59 12	6	9 37 12	10	10 23 15	1	11 3 15	4	40' 4
W.	31	8 19 14	11	8 46 15	6	10 11 13	3	10 40 13	8	11 38 15	7	—	—	41' 4
Half Mean Spring Range.		9ft. 4in.				8ft. 0in.				9ft. 7in.				

Half Mean Spring } 9ft. 4in.
Range.

8ft. 0in.

9ft. 7in.

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	12	38		9	10	48		17	8	36		25	6	11	
2	12	26		10	10	32		18	8	18		26	5	53	
3	12	13		11	10	16		19	8	0		27	5	35	
4	12	0		12	10	0		20	7	43		28	5	16	
5	11	46		13	9	44		21	7	25		29	4	58	
6	11	32		14	9	27		22	7	6		30	4	39	
7	11	18		15	9	10		23	6	48		31	4	21	
8	11	3		16	8	53		24	6	30					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
Dover subtract 5 m. SHEERNESS subtract 3 m. LONDON 0 m.

B 2

MARCH, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.																								
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																				
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																							
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.																							
S.	1	9 42	8 56	9 5	9 32	9 7	3 18	15 6	3 53	16 1	0 11	10 3	0 45	10																													
M.	2	10 7	10 5	9 10	10 31	10 2	4 28	16 9	4 50	17 4	1 17	11 2	1 41	11																													
Tu.	3	10 52	10 53	10 5	11 12	10 8	5 12	18 0	5 30	18 7	2 2	12 1	2 24	12																													
W.	4	11 37	11 31	10 11	11 49	11 2	5 48	19 1	6 5	19 7	2 43	12 10	3 1	13																													
Th.	5	morn.	—	—	0 6	11	6 22	19 11	6 40	20 4	3 18	13 7	3 33	13																													
F.	6	0 21	0 23	11 6	0 39	11 7	6 57	20 8	7 13	21 0	3 49	14 2	4 5	14																													
S.	7	1 7	0 54	11 8	1 11	11 9	7 30	21 2	7 47	21 3	4 21	14 7	4 37	14																													
S.	8	1 55	1 27	11 9	1 45	11 8	8 4	21 4	8 20	21 4	4 54	14 9	5 10	14																													
M.	9	2 45	2 2	11 7	2 20	11 6	8 38	21 2	8 56	20 11	5 28	14 6	5 46	14																													
Tu.	10	3 39	2 38	11 5	2 57	11 3	9 15	20 6	9 35	20 0	6 6	14 0	6 26	13																													
W.	11	4 35	3 17	11 1	3 38	10 10	9 56	19 6	10 19	18 11	6 49	13 3	7 15	13																													
Th.	12	5 33	4 0	10 8	4 24	10 5	10 45	18 4	11 16	17 9	7 41	12 5	8 9	12																													
F.	13	6 32	4 50	10 2	5 21	10 0	11 53	17 2	—	—	8 42	11 7	9 20	11																													
S.	14	7 31	5 57	9 10	6 40	9 9	0 34	16 8	1 16	16 6	10 4	11 1	10 51	11																													
S.	15	8 28	7 31	9 10	8 19	10 0	1 59	16 6	2 42	16 11	11 36	11 4	—	—																													
M.	16	9 23	8 59	10 3	9 38	10 7	3 21	17 6	4 0	18 4	0 14	11 9	0 50	12																													
Tu.	17	10 15	10 10	10 10	10 38	11 2	4 30	19 1	4 56	19 9	1 20	12 10	1 48	13																													
W.	18	11 6	11 3	11 5	11 25	11 8	5 20	20 5	5 42	20 11	2 15	13 9	2 37	14																													
Th.	19	11 55	11 48	11 11	—	—	6 4	21 3	6 25	21 7	2 59	14 6	3 19	14																													
F.	20	0 44	0 8	12 0	0 28	12 1	6 45	21 9	7 5	21 11	3 37	15 0	3 57	15																													
S.	21	1 32	0 46	12 1	1 6	12 0	7 25	21 11	7 45	21 9	4 16	15 2	4 35	15																													
S.	22	2 22	1 27	11 11	1 44	11 9	8 3	21 6	8 20	21 3	4 53	14 11	5 10	14																													
M.	23	3 15	2 2	11 7	2 20	11 5	8 38	20 10	8 55	20 4	5 28	14 3	5 46	13																													
Tu.	24	4 1	2 38	11 2	2 55	10 11	9 13	19 9	9 31	19 1	6 4	13 5	6 23	12																													
W.	25	4 51	3 13	10 8	3 31	10 5	9 49	18 5	10 8	17 10	6 43	12 6	7 4	12																													
Th.	26	5 40	3 49	10 2	4 9	9 11	10 29	17 2	10 55	16 7	7 25	11 7	7 49	11																													
F.	27	6 28	4 30	9 8	4 56	9 6	11 25	16 0	12 0	15 6	8 16	10 9	8 47	10																													
S.	28	7 14	5 25	9 3	5 58	9 2	—	—	0 36	15 2	9 22	10 2	10 3	10																													
S.	29	8 0	6 39	9 1	7 26	9 2	1 13	14 11	1 53	15 0	10 45	10 1	11 24	10																													
M.	30	8 45	8 7	9 4	8 45	9 6	2 31	15 4	3 7	15 10	12 0	10 7	—	—																													
Tu.	31	9 30	9 18	9 9	9 47	10 0	3 39	16 6	4 9	17 2	0 30	11 0	0 59	11																													
Half Mean Spring } Range.			5 ft 9 in.								10 ft 5 in.								7 ft 2 in.																								
Phases of the Moon.																						Moon's Declination at Noon.																					
D. H. M.																						M.D. ° '																					
Full - - - - - 5 2 46 Afternoon.																						1 18 N. 6 9 16 S. 16 17 7 S. 15 25 22 N.																					
Last Quarter - 12 6 55 Afternoon.																						2 14 57 10 19 26 18 2 2 26 21 5																					
New - - - - - 19 2 37 Afternoon.																						3 11 7 11 21 29 19 3 N. 13 27 20 4																					
First Quarter - 27 8 58 Morning.																						4 6 46 12 22 15 20 8 12 28 18 4																					
																						5 2 2 13 21 36 21 12 39 29 15 5																					
In Perigee - - 15 7 0 Morning.																						6 28.52 14 19 35 22 16 24 30 12 2																					
In Apogee - - 27 2 0 Afternoon.																						7 7 43 15 16 20 23 19 17 31 8 1																					
																						8 12 16 16 12 7 24 21 11																					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

MARCH, 1863.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's Age at Noon.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	D.
M.	1	0 25	9 4	0 59	9 8	11 52	12 2	—	—	5 54	8 11	6 26	9 3	11'4
Tu.	2	1 29	10 0	1 50	10 5	0 24	12 7	0 46	13 1	6 47	9 10	7 5	10 5	12'4
W.	3	2 11	10 10	2 29	11 3	1 5	13 7	1 24	14 1	7 21	11 11	7 37	11 6	13'4
Th.	4	3 47	11 9	3 3	12 2	1 42	14 8	1 59	15 2	7 51	12 1	8 6	12 6	14'4
F.	5	3 19	12 6	3 34	12 10	2 16	15 6	2 32	15 11	8 20	12 11	8 36	13 2	0
S.	6	3 49	13 1	4 5	13 4	2 48	16 2	3 3	16 5	8 51	13 5	9 6	13 6	16'4
S.	7	4 22	13 5	4 38	13 6	3 18	16 7	3 33	16 7	9 21	13 7	9 40	13 7	17'4
S.	8	4 56	13 5	5 13	13 4	3 51	16 7	4 8	16 5	9 58	13 5	10 16	13 3	18'4
M.	9	5 31	13 3	5 50	13 1	4 26	16 3	4 45	16 1	10 35	13 1	10 56	12 9	19'4
Tu.	10	6 10	12 10	6 30	12 6	5 5	15 10	5 25	15 6	11 16	12 4	11 39	11 11	20'4
W.	11	6 52	12 2	7 16	11 10	5 47	15 2	6 13	14 8	—	—	0 5	11 6	21'4
T.	12	7 44	11 4	8 14	10 10	6 40	14 1	7 8	13 8	0 32	11 0	1 0	10 6	0
F.	13	8 49	10 4	9 30	10 1	7 44	13 2	8 24	12 10	1 34	10 1	2 15	9 9	23'4
S.	14	10 17	10 0	11 3	10 1	9 9	12 8	9 58	12 9	3 1	9 7	3 54	9 7	24'4
S.	15	11 49	10 5	—	—	10 42	13 0	11 20	13 4	4 42	9 9	5 22	10 0	25'4
M.	16	0 27	10 9	1 3	11 2	11 57	13 10	—	—	5 59	10 6	6 27	11 12	26'4
Tu.	17	1 31	11 11	1 55	12 1	0 25	14 5	0 50	15 0	6 50	11 9	7 11	12 5	27'4
W.	18	2 19	12 7	2 40	13 0	1 14	15 7	1 36	16 1	7 29	13 0	7 48	13 6	28'4
Th.	19	3 1	13 5	3 20	13 8	1 58	16 7	2 18	16 11	8 6	13 11	8 25	14 1	0
F.	20	3 38	13 11	3 57	14 0	2 37	17 1	2 55	17 2	8 43	14 2	9 1	14 1	0'9
S.	21	4 17	14 0	4 37	13 10	3 13	17 2	3 32	17 0	9 21	13 11	9 39	13 8	1'9
S.	22	4 55	13 7	5 13	13 4	3 50	16 9	4 8	16 5	9 58	13 5	10 16	13 0	2'9
M.	23	5 32	13 0	5 50	12 7	4 26	16 0	4 45	15 8	10 35	12 7	10 53	12 1	3'9
Tu.	24	6 8	12 3	6 26	11 10	5 3	15 3	5 21	14 9	11 13	11 7	11 33	11 1	4'9
W.	25	6 45	11 5	7 5	11 0	5 41	14 4	6 2	13 9	11 54	10 7	—	—	5'9
Th.	26	7 27	10 6	7 53	10 0	6 24	13 3	6 48	12 9	0 15	10 1	0 40	9 7	6'9
F.	27	8 22	9 7	8 56	9 3	7 17	12 4	7 50	11 11	1 8	9 3	1 41	8 10	7'9
S.	28	9 33	9 0	10 15	9 0	8 26	11 8	9 8	11 6	2 17	8 7	3 1	8 5	8'9
S.	29	10 57	1	11 37	9 3	9 52	11 7	10 30	11 9	3 49	8 5	4 30	8 7	9'9
M.	30	—	—	0 14	9 7	11 7	12 1	11 37	12 6	5 8	8 9	5 39	9 1	10'9
Tu.	31	0 44	9 11	1 11	10 4	—	—	0 6	12 11	6 7	9 7	6 31	10 2	11'9
Half Mean Spring Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	12	38	Sub.	9	10	48	Sub.	17	8	36	Sub.	25	6	11	Sub.
2	12	26		10	10	32		18	8	18		26	5	59	
3	12	13		11	10	16		19	8	0		27	5	35	
4	12	0		12	10	0		20	7	43		28	5	16	
5	11	46		13	9	44		21	7	25		29	4	58	
6	11	32		14	9	27		22	7	6		30	4	39	
7	11	18		15	9	10		23	6	48		31	4	21	
8	11	3		16	8	53		24	6	30					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 NORTH SHIELDS add 6 m. LEITH add 12 m. THURSO add 14 m.

MARCH, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	9 21	9 0	8 0	9 34	8 2	8 29	19 6	9 12	20 3	2 52	14 9	3 28	15 0
Tu.	2	10 7	10 0	8 5	10 22	8 7	9 25	21 1	9 45	21 11	3 56	16 3	4 20	17 1
W.	3	10 52	10 43	8 10	11 3	9 0	10 32	22 9	10 21	23 5	4 43	17 10	5 5	18 1
Th.	4	11 37	11 23	9 2	11 41	9 3	10 37	24 1	10 55	24 8	5 25	19 2	5 45	19 4
F.	5	morn.	11 59	9 5	—	—	11 11	25 2	11 28	25 8	6 3	20 3	6 20	20 1
S.	6	0 21	0 16	9 7	0 33	9 9	11 45	26 1	—	—	6 36	21 1	6 53	21 1
M.	7	1 7	0 50	9 10	1 7	9 11	0 26	4	0 18	26 6	7 9	21 6	7 26	21 1
Tu.	8	1 55	1 25	9 11	1 42	9 11	0 36	26 8	0 53	26 7	7 43	21 6	8 0	21 1
W.	9	2 45	2 0	9 11	2 18	9 10	1 11	26 5	1 28	26 0	8 18	21 0	8 37	20 1
Th.	10	3 39	2 37	9 9	2 55	9 7	1 46	25 7	2 5	24 11	8 57	20 2	9 18	19 1
F.	11	4 35	3 15	9 5	3 37	9 3	2 26	24 3	2 48	23 7	9 39	18 11	10 1	18 1
S.	12	5 33	4 1	9 1	4 27	8 11	3 12	22 9	3 38	22 0	10 25	17 7	10 51	16 1
M.	13	6 32	4 56	8 9	5 32	8 6	4 10	21 3	4 48	21 7	11 20	16 8	11 57	15 1
Tu.	14	7 31	6 12	8 4	6 58	8 3	5 33	20 3	6 25	20 4	—	—	0 39	15 1
W.	15	8 28	7 45	8 4	8 27	8 6	7 15	20 9	7 55	21 6	1 29	15 11	2 17	16 1
Th.	16	9 23	9 7	9 9	9 40	9 0	8 35	22 5	9 42	23 3	3 0	17 4	3 35	18 1
F.	17	10 15	10 8	9 3	10 34	9 5	9 29	24 3	9 54	25 1	4 6	19 1	4 34	19 1
S.	18	11 6	10 58	9 7	11 21	9 9	10 15	25 9	10 36	26 4	5 0	20 1	5 25	21 1
M.	19	11 55	11 43	9 11	—	—	10 57	26 9	11 17	27 1	5 48	21 1	6 8	21 1
Tu.	20	0 44	0 4	10 0	0 25	10 11	11 37	27 3	11 57	27 4	6 28	22 1	6 48	22 1
W.	21	1 32	0 45	10 1	1 6	10 1	—	—	0 17	27 2	7 7	22 0	7 25	21 1
Th.	22	2 22	1 25	10 0	1 42	9 11	0 35	26 11	0 53	26 6	7 43	21 5	8 0	21 1
F.	23	3 11	2 0	9 9	2 17	9 8	1 11	26 0	1 28	25 3	8 18	20 5	8 36	19 1
S.	24	4 1	2 34	9 6	2 51	9 3	1 44	24 6	2 23	23 9	8 54	19 1	9 11	18 1
M.	25	4 51	3 8	9 1	3 26	8 11	2 19	22 11	2 37	22 2	9 28	17 8	9 46	16 1
Tu.	26	5 40	3 46	8 8	4 7	8 6	2 57	21 4	3 18	20 6	10 5	16 3	10 28	15 1
W.	27	6 28	4 32	8 4	5 0	8 1	3 44	19 9	4 15	19 1	10 51	14 11	11 19	14 1
Th.	28	7 14	5 32	7 11	6 10	7 10	4 52	18 6	5 32	18 4	11 53	14 1	—	—
F.	29	8 0	6 52	7 9	7 33	7 9	6 19	18 5	7 3	18 10	0 33	14 0	1 16	14 1
S.	30	8 45	8 11	7 11	8 46	8 2	7 41	19 4	8 14	20 1	1 59	14 7	2 37	15 1
M.	31	9 30	9 16	8 4	9 44	8 7	8 43	20 10	9 8	21 9	3 10	16 0	3 39	16 1

Half Mean Spring } 4 ft. 10 in.
Range.

13 ft. 0 in.

10 ft. 6 in.

Phases of the Moon.

	D.	H.	M.	
Full - - - - -	5	2	46	Afternoon.
Last Quarter -	12	6	55	Afternoon.
New - - - - -	19	2	37	Afternoon.
First Quarter -	27	8	58	Morning.
In Perigee - -	15	7	0	Morning.
In Apogee - -	27	2	0	Afternoon.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	18	N. 6	9	16	S. 16	17	7	S. 15	25	22	N. 1
2	14	57	10	19	26	18	2	2	26	21	5.
3	11	7	11	21	29	19	3	N. 13	27	20	4.
4	6	46	12	22	15	20	8	12	28	18	4.
5	2	2	13	21	36	21	12	39	29	15	5.
6	2	S. 52	14	19	35	22	16	24	30	12	2
7	7	43	15	16	20	23	19	17	31	8	1.
8	12	16	16	12	7	24	21	11			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—

GREENOCK add 19 m.

|

LIVERPOOL add 23 m.

|

PEMBROKE add 20 m.

MARCH, 1863.

MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's Age AT NOON.
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	D.						
1	3 24 27 4		4 2 28 4		7 26 12 2		7 57 12 7		8 14 8 9		8 47 9 0		11.4												
2	4 34 29 6		4 59 30 9		8 21 13 1		8 41 13 7		9 13 9 3		9 35 9 6		12.4												
3	5 24 32 0		5 46 33 2		8 59 14 0		9 16 14 6		9 57 9 9		10 16 10 0		13.4												
4	6 6 34 3		6 26 35 1		9 32 14 11		9 49 15 3		10 32 10 3		10 47 10 6		14.4												
5	6 45 35 11		7 2 36 7		10 5 15 7		10 21 15 10		11 2 10 8		11 18 10 11		○												
6	7 19 37 3		7 36 37 9		10 36 16 1		10 50 16 3		11 33 11 0		11 49 11 1		16.4												
7	7 52 38 1		8 9 38 2		11 5 16 4		11 21 16 4		— — 0 5		11 17.4														
8	8 26 38 1		8 43 37 11		11 38 16 3		11 57 16 2		0 24 11 1		0 42 11 0		18.4												
9	9 0 37 7		9 18 37 1		— — — —		0 16 16 0		1 0 10 11		1 19 10 10		19.4												
0	9 35 36 5		9 53 35 5		0 37 15 8		0 58 15 4		1 40 10 8		1 59 10 5		20.4												
1	10 12 34 4		10 31 33 2		1 21 14 11		1 46 14 6		2 21 10 2		2 46 10 0		21.4												
2	10 52 32 0		11 18 30 9		2 13 14 0		2 41 13 7		3 12 9 9		3 40 9 6		22.4												
3	11 52 29 9		— — — —		3 15 13 2		3 56 12 10		4 14 9 3		4 54 9 0		23.4												
4	0 32 29 1		1 17 29 0		4 42 12 8		5 31 12 9		5 36 8 11		6 20 9 0		24.4												
5	2 5 29 5		2 50 30 4		6 16 13 1		6 54 13 5		7 3 9 2		7 41 9 5		25.4												
6	3 34 31 5		4 12 32 8		7 31 13 11		8 0 14 5		8 20 9 8		8 52 10 0		26.4												
7	4 44 34 0		5 15 35 5		8 25 15 0		8 49 15 6		9 21 10 3		9 48 10 7		27.4												
8	5 41 36 7		6 6 37 6		9 10 15 11		9 30 16 3		10 9 10 10		10 29 11 0		28.4												
9	6 30 38 3		6 51 38 8		9 50 16 7		10 10 16 9		10 48 11 3		11 6 11 4		●												
0	7 11 38 11		7 32 39 2		10 28 16 10		10 45 16 10		11 25 11 5		11 44 11 5		0.9												
1	7 51 38 11		8 9 38 7		11 3 16 8		11 20 16 6		— — 0 5		11 4 1.9														
2	8 26 38 1		8 43 37 4		11 38 16 3		11 57 15 11		0 23 11 2		0 42 11 0		2.9												
3	8 59 36 7		9 15 35 8		— — — —		0 16 15 6		1 0 10 10		1 19 10 7		3.9												
4	9 31 34 7		9 46 33 6		0 35 15 1		0 55 14 7		1 37 10 3		1 56 10 0		4.9												
5	10 1 32 4		10 16 31 1		1 15 14 1		1 35 13 7		2 15 9 9		2 35 9 6		5.9												
6	10 33 29 11		10 55 28 9		1 57 13 2		2 21 12 8		2 56 9 3		3 20 9 0		6.9												
7	11 20 27 7		11 52 26 9		2 49 12 3		3 22 11 11		3 47 8 9		4 20 8 6		7.9												
8	— — — —		0 29 26 3		3 58 11 8		4 41 11 6		4 56 8 4		5 33 8 3		8.9												
9	1 12 26 3		1 54 26 7		5 25 11 8		6 4 11 10		6 14 8 4		6 51 8 6		9.9												
0	2 33 27 2		3 9 28 1		6 41 12 2		7 11 12 6		7 28 8 8		7 59 8 11		10.9												
1	3 44 29 2		4 15 30 4		7 39 13 0		8 4 13 6		8 29 9 2		8 56 9 5		11.9												
Mean Spring Range.				18ft. 7in.				8ft. 0in.				5ft. 6in.													

Equation of Time at Noon.

M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
12 38	Sub.	9	10 48	Sub.	17	8 36	Sub.	25	6 11	Sub.
12 26		10	10 32		18	8 18		26	5 53	
12 13		11	10 16		19	8 0		27	5 35	
12 0		12	10 0		20	7 43		28	5 16	
11 46		13	9 44		21	7 25		29	4 58	
11 32		14	9 27		22	7 6		30	4 39	
11 18		15	9 10		23	6 48		31	4 21	
11 3		16	8 53		24	6 30				

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

MARCH, 1863.

WEEK DAY.		MONTH DAY.		MOON'S TRANSIT.		BELFAST.				LONDONDERRY.				SLIGO BAY.													
						MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.											
						Time.		Height.		Time.		Height.		Time.		Height.											
		H. M.		F. I.		H. M.		F. I.		H. M.		F. I.		H. M.		F. I.											
S.	1	9	21	8	0	7	9	8	32	8	0	5	21	5	10	5	47										
M.	2	10	7	8	55	8	3	9	14	8	6	6	7	6	2	6	25										
Tu.	3	10	52	9	33	8	8	9	51	8	11	6	43	6	8	7	2										
W.	4	11	37	10	8	9	1	10	25	9	3	7	20	7	1	7	38										
Th.	5	morn.		10	41	9	4	10	57	9	5	7	55	7	5	8	11										
F.	6	0	21	11	12	9	6	11	27	9	6	8	26	7	9	8	41										
S.	7	1	7	11	42	9	7	11	59	9	7	8	55	7	11	9	11										
S.	8	1	55	—	—	—	—	0	17	9	6	9	27	7	9	9	44										
M.	9	2	45	0	36	9	6	0	55	9	5	10	1	7	6	10	19										
Tu.	10	3	39	1	16	9	4	1	37	9	3	10	38	7	2	10	59										
W.	11	4	35	2	0	9	1	2	27	8	11	11	27	6	7	11	59										
Th.	12	5	33	2	55	8	9	3	23	8	6	—	—	—	—	0	36										
F.	13	6	32	3	57	8	4	4	35	8	3	1	18	5	9	2	6										
S.	14	7	31	5	17	8	2	6	1	8	1	2	54	5	8	3	39										
S.	15	8	28	6	47	8	2	7	27	8	3	4	20	6	2	4	52										
M.	16	9	23	8	5	8	5	8	34	8	8	5	22	6	8	5	46										
Tu.	17	10	15	8	59	9	0	9	24	9	3	6	10	7	2	6	34										
W.	18	11	6	9	46	9	5	10	7	9	7	6	57	7	8	7	19										
Th.	19	11	55	10	26	9	8	10	45	9	9	7	40	8	0	8	0										
F.	20	0	44	11	4	9	9	11	23	9	9	8	18	8	2	8	36										
S.	21	1	32	11	41	9	8	11	59	9	7	8	53	8	1	9	10										
S.	22	2	22	—	—	—	—	0	17	9	6	9	27	7	9	9	44										
M.	23	3	11	0	36	9	5	0	55	9	3	10	0	7	3	10	16										
Tu.	24	4	1	1	13	9	2	1	33	9	0	10	34	6	9	10	53										
W.	25	4	51	1	54	8	9	2	16	8	7	11	16	6	2	11	43										
Th.	26	5	40	2	39	8	5	3	3	8	2	—	—	—	—	0	14										
F.	27	6	28	3	31	8	0	4	2	7	11	0	49	5	3	1	28										
S.	28	7	14	4	37	7	9	5	15	7	8	2	10	5	0	2	52										
S.	29	8	0	5	55	7	8	6	35	7	8	3	33	5	3	4	9										
M.	30	8	45	7	13	7	9	7	45	7	11	4	41	5	9	5	7										
Tu.	31	9	30	8	14	8	1	8	38	8	4	5	30	6	2	5	50										
Half Mean Spring } Range.						4 ft. 9 in.						3 ft. 10 in.						5 ft. 7 in.									
Phases of the Moon.														Moon's Declination at Noon.													
D. H. M.														M.D. ° '													
Full - - - - - 5 2 46 Afternoon.														1 18 N. 6 9 16 S. 16 17 7 S. 15 25 22 N.													
Last Quarter - 12 6 55 Afternoon.														2 14 57 10 19 26 18 2 2 26 21 9													
New - - - - - 19 2 37 Afternoon.														3 11 7 11 21 29 19 3 N. 13 27 20 4													
First Quarter 27 8 58 Morning.														4 6 46 12 22 15 20 8 12 28 18 7													
														5 2 2 13 21 36 21 12 39 29 15 1													
In Perigee - - 15 7 0 Morning.														6 2 S. 52 14 19 35 22 16 24 30 12 2													
In Apogee - - 27 2 0 Afternoon.														7 7 43 15 16 20 23 19 17 31 8 3													
														8 12 16 16 12 7 24 21 11													

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required, —
 BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

MARCH, 1863.

GALWAY.					QUEENSTOWN.					WATERFORD.					C's Aug at Noon.	
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.				
Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.		Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.		Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.			
1 44 10 5		2 15 10 11			1 48 8 9		2 24 9 0			1 57 9 5		2 33 9 9		11.4		
2 38 11 5		2 59 11 11			2 52 9 4		3 15 9 9			3 2 10 2		3 29 10 6		12.4		
3 19 12 5		3 38 12 11			3 37 10 1		3 57 10 6			3 53 10 11		4 15 11 3		13.4		
3 55 13 4		4 11 13 9			4 16 10 10		4 34 11 1			4 35 11 7		4 56 11 10		14.4		
4 28 14 2		4 44 14 6			4 51 11 4		5 8 11 7			5 14 12 1		5 31 12 3		15.4		
5 0 14 10		5 16 15 1			5 25 11 10		5 43 11 11			5 47 12 5		6 3 12 7		16.4		
5 32 15 2		5 50 15 3			6 0 12 0		6 18 12 1			6 19 12 8		6 37 12 9		17.4		
6 8 15 2		6 26 15 0			6 34 12 0		6 52 11 11			6 55 12 9		7 14 12 8		18.4		
6 44 14 10		7 4 14 6			7 10 11 9		7 29 11 7			7 31 12 7		7 50 12 5		19.4		
7 24 14 2		7 46 13 9			7 48 11 4		8 8 11 0			8 8 12 3		8 27 12 0		20.4		
8 11 13 2		8 37 12 7			8 30 10 9		8 52 10 4			8 48 11 8		9 9 11 4		21.4		
9 5 12 0		9 36 11 6			9 17 10 0		9 43 9 8			9 31 11 0		9 59 10 8		22.4		
10 14 11 1		10 58 10 11			10 16 9 5		10 57 9 3			10 37 10 4		11 18 10 1		23.4		
11 45 11 1		—			11 43 9 2		—			—		0 1 9 11		24.4		
0 33 11 3		1 13 11 8			0 31 9 4		1 14 9 7			0 44 10 1		1 24 10 4		25.4		
1 49 12 3		2 17 12 10			1 56 10 0		2 31 10 4			2 4 10 9		2 43 11 2		26.4		
2 44 13 5		3 10 14 0			3 0 10 9		3 28 11 2			3 14 11 7		3 44 11 11		27.4		
3 32 14 6		3 53 14 10			3 52 11 6		4 15 11 10			4 10 12 3		4 36 12 7		28.4		
4 13 15 3		4 33 15 6			4 36 12 1		4 56 12 3			4 59 12 9		5 19 12 10		29.4		
4 51 15 8		5 11 15 8			5 17 12 4		5 38 12 4			5 39 12 11		5 59 13 0		30.4		
5 31 15 7		5 50 15 5			5 58 12 3		6 17 12 2			6 19 12 11		6 37 12 10		31.4		
6 8 15 1		6 26 14 9			6 35 12 0		6 52 11 9			6 55 12 8		7 14 12 6		32.4		
6 44 14 4		7 2 13 10			7 10 11 5		7 27 11 1			7 31 12 3		7 47 12 0		33.4		
7 21 13 4		7 40 12 10			7 44 10 9		8 1 10 5			8 4 11 9		8 20 11 5		34.4		
8 0 12 3		8 21 11 7			8 18 10 1		8 36 9 8			8 37 11 1		8 53 10 8		35.4		
8 45 11 0		9 10 10 6			8 57 9 4		9 20 9 0			9 11 10 4		9 34 10 0		36.4		
9 41 10 1		10 16 9 9			9 45 8 9		10 16 8 6			10 4 9 8		10 38 9 4		37.4		
10 56 9 1		11 41 9 9			10 55 8 4		11 38 8 4			11 15 9 2		11 55 9 1		38.4		
—		0 21 10 0			—		0 19 8 6			—		0 32 9 3		39.4		
0 58 10 4		1 29 10 9			0 57 8 8		1 33 9 0			1 9 9 5		1 42 9 8		40.4		
1 57 11 3		2 21 11 10			2 6 9 3		2 35 9 8			2 15 10 0		2 45 10 5		41.4		
Mean Spring } Range.					7ft. 5in.					5ft. 10in.					6ft. 2in.	

Equation of Time at Noon.

M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
12 38		9	10 48		17	8 36		25	6 11	
12 26		10	10 32		18	8 18		26	5 53	
12 13		11	10 16		19	8 0		27	5 35	
12 0		12	10 0		20	7 43		28	5 16	
11 46		13	9 44		21	7 25		29	4 58	
11 32		14	9 27		22	7 6		30	4 39	
11 18		15	9 10		23	6 48		31	4 21	
11 3		16	8 53		24	6 30				

Uses of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
 GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 8 m.

APRIL, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.
W.	1	10 14	1 52 15 8	2 12 16 6	3 29 13 8	3 52 13 5	9 44 11 2	10 6 11						
Th.	2	11 0	2 27 17 3	2 44 17 11	4 15 14 6	4 37 14 4	10 24 11 11	10 40 12						
F.	3	11 48	3 2 18 6	3 26 19 1	4 57 15 3	5 17 15 1	10 58 12 5	11 16 12						
S.	4	MOON	3 38 19 5	3 57 19 8	5 35 15 8	5 54 15 7	11 34 12 10	11 53 12 1						
M.	5	0 38	4 16 19 9	4 35 19 10	6 13 15 10	6 33 15 9	—	—	0 12 13					
Th.	6	1 32	4 53 19 9	5 14 19 7	6 52 15 10	7 9 15 9	0 32 13 0	0 52 12 1						
W.	7	2 28	5 32 19 4	5 53 19 0	7 28 15 7	7 47 15 6	1 12 12 10	1 33 12 1						
Th.	8	3 27	6 15 18 6	6 37 17 11	8 8 15 1	8 29 15 1	1 54 12 7	2 16 12						
F.	9	4 27	7 2 17 2	7 31 16 5	8 51 14 5	9 13 14 6	2 38 12 2	3 3 11 1						
S.	10	5 26	7 59 15 7	8 32 14 11	9 39 13 7	10 7 13 9	3 30 11 6	3 57 11						
M.	11	6 23	9 8 14 6	9 49 14 4	10 39 12 9	11 14 13 1	4 29 10 10	5 4 10						
Th.	12	7 18	10 33 14 5	11 17 14 8	11 57 12 4	—	—	5 42 10 4	6 24 10					
W.	13	8 10	11 57 15 1	—	0 42 13 2	1 27 12 8	7 6 10 5	7 44 10						
Th.	14	9 0	0 31 15 8	1 2 16 3	2 7 13 9	2 41 13 4	8 20 11 1	8 53 11						
F.	15	9 48	1 31 16 11	1 56 17 7	3 13 14 6	3 40 14 3	9 23 11 9	9 50 12						
S.	16	10 36	2 19 18 2	2 39 18 7	4 7 15 2	4 31 15 0	10 14 12 4	10 34 12						
M.	17	11 24	3 59 19 0	3 19 19 3	4 53 15 7	5 15 15 5	10 55 12 8	11 15 12						
Th.	18	0 12	3 38 19 4	3 55 19 3	5 34 15 8	5 53 15 7	11 34 12 9	11 52 12						
W.	19	1 2	4 14 19 1	4 33 18 10	6 12 15 7	6 30 15 6	—	—	0 11 12					
Th.	20	1 52	4 51 18 7	5 8 18 3	6 48 15 3	7 3 15 1	0 30 12 6	0 50 12						
F.	21	2 42	5 26 17 10	5 43 17 5	7 18 14 9	7 34 14 8	1 8 12 2	1 26 12						
S.	22	3 32	6 1 17 0	6 19 16 5	7 50 14 0	8 6 14 1	1 44 11 10	2 2 11						
M.	23	4 20	6 37 15 10	6 58 15 3	8 21 13 3	8 37 13 5	2 20 11 5	2 38 11						
Th.	24	5 8	7 20 14 7	7 42 14 0	8 55 12 5	9 15 12 9	2 59 10 10	3 19 10						
F.	25	5 53	8 7 13 6	8 35 13 1	9 36 11 8	10 2 12 1	3 40 10 4	4 4 10						
S.	26	6 38	9 6 12 11	9 42 12 11	10 31 11 2	11 0 11 10	4 31 9 10	5 1 9						
M.	27	7 22	10 22 13 0	11 0 13 3	11 39 11 1	—	—	5 35 9 7	6 13 9					
Th.	28	8 6	11 34 13 8	—	0 21 12 0	1 0 11 8	6 49 9 9	7 22 10						
W.	29	8 51	0 8 14 2	0 37 14 9	1 36 12 8	2 11 12 6	7 55 10 4	8 26 10						
Th.	30	9 37	1 3 15 5	1 28 16 1	2 41 13 6	3 9 13 6	8 54 11 0	9 20 11						

Half Mean Spring } 9 ft. 6 in.
Range.

7 ft. 9 in.

6 ft. 4 in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Full - - - - -	4	4	9	Morning.
Last Quarter -	11	1	23	Morning.
New - - - - -	18	3	5	Morning.
First Quarter	26	4	8	Morning.
In Perigee - -	9	5	0	Morning.
In Apogee - -	24	9	0	Morning.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	3	N. 39	9	21	S. 38	17	11	N. 9	25	16	N. 41
2	18	12	10	19	55	18	15	6	26	13	21
3	6	6	11	16	58	19	18	15	27	9	36
4	10	49	12	13	4	20	20	29	28	5	1
5	15	3	13	8	28	21	21	43	29	0	34
6	18	31	14	3	29	22	21	54	30	4	S. 10
7	20	54	15	1	N. 37	23	21	5			
8	21	58	16	6	35	24	19	20			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 Brest add 18 m. | Devonport add 17 m. | Portsmouth add 4 m.

APRIL, 1863.

NORTH SHIELDS.								LEITH.								THURSO.								C's Age at Noon.
Morning.				Afternoon.				Morning.				Afternoon.				Morning.				Afternoon.				
Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
L. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.		
35	10	9		1	54	11	2	0	29	13	5	0	48	13	11	6	49	10	9	7	5	11	5	12.9
13	11	8		2	28	12	1	1	6	14	6	1	23	15	1	7	18	11	11	7	33	12	5	13.9
44	12	6		3	1	12	10	1	40	15	6	1	58	15	11	7	48	12	10	8	4	13	3	14.9
17	13	2		3	34	13	5	2	15	16	3	2	33	16	7	8	21	13	7	8	39	13	8	○
52	13	7		4	11	13	8	2	51	16	9	3	8	16	10	8	56	13	9	9	14	13	9	16.9
30	13	8		4	49	13	7	3	25	16	9	3	44	16	8	9	34	13	8	9	54	13	6	17.9
9	13	5		5	30	13	2	4	4	16	6	4	25	16	3	10	15	13	3	10	38	12	11	18.9
53	12	11		6	16	12	8	4	47	16	0	5	10	15	8	11	1	12	6	11	26	12	1	19.9
39	12	4		7	5	11	11	5	34	15	3	6	1	14	9	11	53	11	7	—	—	—	—	20.9
35	11	5		8	8	10	11	6	32	14	3	7	3	13	9	0	23	11	1	0	54	10	8	21.9
46	10	6		9	28	10	3	7	41	13	4	8	22	13	1	1	31	10	3	2	13	10	0	0
13	10	3		10	55	10	4	9	5	12	11	9	50	13	0	2	58	9	10	3	46	9	12	23.9
35	10	7		—	—	—	—	10	28	13	3	11	3	13	7	4	28	10	0	5	5	10	3	24.9
10	10	11		0	40	11	3	11	34	13	11	—	—	—	—	5	36	10	7	6	4	11	1	25.9
8	11	7		1	34	—	0	0	2	14	4	0	28	14	9	6	29	11	7	6	50	12	1	26.9
57	12	4		2	19	12	8	0	51	15	3	1	14	15	8	7	10	12	6	7	27	12	11	27.9
38	12	11		2	57	13	2	1	34	16	0	1	54	16	3	7	44	13	3	8	2	13	5	28.9
16	13	3		3	34	13	4	2	14	16	5	2	52	16	6	8	21	13	6	8	37	13	5	●
52	13	4		4	10	13	—	2	49	16	5	3	6	16	4	8	54	13	3	9	12	13	1	1.4
28	13	1		4	47	12	10	3	23	16	1	3	42	15	10	9	32	12	10	9	50	12	6	2.4
5	12	6		5	24	12	3	4	0	15	6	4	18	15	3	10	8	12	2	10	27	11	10	3.4
42	12	0		6	1	11	—	4	37	14	11	4	56	14	7	10	46	11	6	11	7	11	1	4.4
20	11	5		6	39	11	1	5	15	14	3	5	35	13	10	11	27	10	—	11	50	10	3	5.4
1	10	9		7	25	10	4	5	58	13	5	6	21	13	0	—	—	—	—	0	13	9	10	6.4
50	9	11		8	19	9	7	6	45	12	8	7	14	12	4	0	37	9	6	1	4	9	3	7.4
52	9	5		9	27	9	4	7	46	12	1	8	20	12	0	1	37	9	1	2	11	8	11	8
6	9	4		10	44	9	6	8	59	11	11	9	39	12	1	2	51	8	11	3	35	8	11	9.4
19	9	9		11	50	10	0	10	13	12	3	10	43	12	7	4	12	9	1	4	44	9	4	10.4
—	—	—		0	19	10	4	11	12	12	11	11	39	13	4	5	14	9	7	5	41	10	0	11.4
46	10	9		1	9	11	1	—	—	—	—	0	3	13	9	6	5	10	6	6	26	11	0	12.4
mean Spring } range.				6 ⁿ . 8 ⁿ .				8 ⁿ . 2 ⁿ .				6 ⁿ . 7 ⁿ .												

Equation of Time at Noon.

L. S.		M.D.	M. S.		M.D.	M. S.		M.D.	M. S.	
4 2	Sub.	9	1 41	Sub.	17	0 24	Add.	25	2 4	Add.
3 44		10	1 24		18	0 38		26	2 14	
3 26		11	1 8		19	0 51		27	2 24	
3 8		12	0 52		20	1 4		28	2 34	
2 50		13	0 36		21	1 17		29	2 43	
2 33		14	0 21		22	1 29		30	2 52	
2 15		15	0 5		23	1 41				
1 58		16	0 9	Add.	24	1 53				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

APRIL, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.																																		
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																														
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.																												
		H.	M.	P.	I.	H.	M.	P.	I.	H.	M.	P.	I.	H.	M.	P.	I.	H.	M.	P.	I.	H.	M.	P.	I.																												
W.	1	10 14	10	14	10	4	10	36	10	7	4	34	17	10	4	55	18	5	1	24	11	11	1	46	13																												
Th.	2	11 0	10	56	10	11	11	11	11	2	5	13	19	1	5	28	19	8	2	7	12	10	2	24	13																												
F.	3	11 48	11	30	11	5	11	48	11	6	5	45	20	1	6	4	20	5	2	42	13	7	3	0	13																												
S.	4	morn.	—	—	—	—	0	6	11	—	6	23	20	10	6	42	21	1	3	17	14	3	3	34	14																												
S.	5	0 38	0	24	11	9	0	42	11	10	7	1	21	4	7	19	21	6	3	53	14	9	4	11	14																												
M.	6	1 32	1	0	11	10	1	19	11	10	7	39	21	6	7	58	21	6	4	29	14	11	4	47	14																												
Tu.	7	2 28	1	39	11	9	1	58	11	8	8	16	21	4	8	37	21	1	5	6	14	8	5	27	14																												
W.	8	3 27	2	19	11	6	2	41	11	4	8	58	20	9	9	20	20	2	5	49	14	1	6	12	13																												
Th.	9	4 27	3	3	11	2	3	25	10	11	9	43	19	8	10	8	19	1	6	36	13	4	7	3	12																												
F.	10	5 26	3	49	10	8	4	17	10	6	10	37	18	6	11	10	17	10	7	33	12	6	8	3	12																												
S.	11	6 23	4	44	10	3	5	18	10	11	11	50	17	4	—	—	—	—	8	39	11	9	9	18	11																												
S.	12	7 18	5	54	9	11	6	36	9	11	0	32	16	11	1	12	16	9	10	0	11	4	10	43	11																												
M.	13	8 10	7	23	10	0	8	5	10	2	1	51	16	10	2	29	17	4	11	22	11	7	11	56	11																												
Tu.	14	9 0	8	42	10	4	9	15	10	7	3	4	17	9	3	36	18	5	—	—	—	—	0	27	12																												
W.	15	9 48	9	45	10	10	10	14	11	1	4	6	19	0	4	34	19	7	0	56	12	9	1	24	13																												
Th.	16	10 36	10	40	11	3	11	3	11	6	4	58	20	0	5	20	20	5	1	51	13	6	2	15	13																												
F.	17	11 24	11	24	11	8	11	45	11	—	5	40	20	8	6	1	20	11	2	36	14	0	2	57	14																												
S.	18	0 12	—	—	—	—	0	5	11	9	6	22	21	0	6	42	21	0	3	16	14	4	3	34	14																												
S.	19	1 2	0	23	11	9	0	40	11	8	7	0	21	0	7	18	20	10	3	51	14	5	4	9	14																												
M.	20	1 52	0	59	11	7	1	18	11	5	7	37	20	8	7	55	20	5	4	27	14	4	4	45	14																												
Tu.	21	2 42	1	37	11	4	1	54	11	2	8	12	20	2	8	30	19	10	5	2	13	10	5	20	13																												
W.	22	3 32	2	12	10	11	2	30	10	9	8	48	19	5	9	6	18	11	5	38	13	2	5	57	12																												
Th.	23	4 20	2	48	10	7	3	7	10	5	9	25	18	5	9	44	17	11	6	17	12	6	6	37	12																												
F.	24	5 8	3	25	10	2	3	45	10	0	10	4	17	5	10	26	16	11	6	59	11	9	7	22	11																												
S.	25	5 53	4	5	9	9	4	27	9	7	10	52	16	5	11	22	16	1	7	46	11	1	8	12	10																												
S.	26	6 38	4	53	9	6	5	21	9	5	11	56	15	9	—	—	—	—	8	43	10	7	9	16	10																												
M.	27	7 22	5	52	9	4	6	29	9	4	0	30	15	7	1	5	15	6	9	54	10	5	10	32	10																												
Tu.	28	8 6	7	12	9	5	7	49	9	7	1	40	15	8	2	14	16	0	11	7	10	8	11	37	11																												
W.	29	8 51	8	21	9	9	8	52	10	0	2	44	16	5	3	13	17	1	—	—	—	—	0	5	11																												
Th.	30	9 37	9	20	10	3	9	46	10	6	3	42	17	8	4	7	18	3	0	32	11	10	0	57	12																												
Half Mean Spring } Range.			5ft. 9in.								10ft. 5in.								7ft. 2in.																																		
Phases of the Moon.																											Moon's Declination at Noon.																										
D. H. M.																											M.D. ° ' "																										
Full	—	—	4	4	9	Morning.	1	3	N. 39	9	21	S. 38	17	11	N. 9	25	16	N. 4																																			
Last Quarter	—	—	11	1	23	Morning.	2	1	S. 12	10	19	55	18	15	6	26	13	1																																			
New	—	—	18	3	5	Morning.	3	6	6	11	16	58	19	18	15	27	9	9																																			
First Quarter	—	—	26	4	8	Morning.	4	10	49	11	13	4	20	20	29	28	5	1																																			
																											5	15	3	13	8	28	21	21	43	29	0	5															
In Perigee	—	—	9	5	0	Morning.	6	18	31	14	3	29	22	21	54	30	4	1																																			
In Apogee	—	—	24	9	0	Morning.	7	20	54	15	1	N. 37	23	21	5																																						
																											8	21	58	16	6	35	24	19	20																		

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

APRIL, 1863.

NORTH SHIELDS.							LEITH.							THURSO.							C's AGE AT NOON.						
MORNING.				AFTERNOON.			MORNING.				AFTERNOON.			MORNING.				AFTERNOON.									
no.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.										
M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.								
35	10	9	1	54	11	2	0	29	13	5	0	48	13	11	6	49	10	9	7 5 11 5 12.9								
13	11	8	2	28	12	1	1	6	14	6	1	23	15	1	7	18	11	11	7 33 12 5 13.9								
44	12	6	3	1	12	10	1	40	15	6	1	58	15	11	7	48	12	10	8 4 13 3 14.9								
17	13	2	3	34	13	5	2	15	16	3	2	33	16	7	8	21	13	7	8 39 13 8 ○								
52	13	7	4	11	13	8	2	51	16	9	3	8	16	10	8	56	13	9	9 14 13 9 16.9								
30	13	8	4	49	13	7	3	25	16	9	3	44	16	8	9	34	13	8	9 54 13 6 17.9								
9	13	5	5	30	13	2	4	4	16	6	4	25	16	3	10	15	13	3	10 38 12 11 18.9								
53	12	11	6	16	12	8	4	47	16	0	5	10	15	8	11	1	12	11	11 26 12 1 19.9								
39	12	4	7	5	11	11	5	34	15	3	6	1	14	9	11	53	11	7	— — — — 20.9								
35	11	5	8	8	10	11	6	32	14	3	7	3	13	9	0	23	11	1	0 54 10 8 21.9								
46	10	6	9	28	10	3	7	41	13	4	8	22	13	1	1	31	10	3	2 13 10 0 22.9								
13	10	3	10	55	10	4	9	5	12	11	9	50	13	0	2	58	10	10	3 46 9 11 23.9								
35	10	7	—	—	—	—	10	28	13	3	11	3	13	7	4	28	10	0	5 5 10 3 24.9								
10	10	11	0	40	11	3	11	34	13	11	—	—	—	—	5	36	10	7	6 4 11 1 25.9								
8	11	7	1	34	12	0	0	2	14	4	0	28	14	9	6	29	11	7	6 50 12 1 26.9								
57	12	4	2	19	12	11	0	51	15	3	1	14	15	8	7	10	12	6	7 27 12 11 27.9								
38	12	11	2	57	13	2	1	34	16	0	1	54	16	3	7	44	13	3	8 2 13 5 28.9								
16	13	3	3	34	13	4	2	14	16	5	2	52	16	6	8	21	13	6	8 37 13 5 ●								
52	13	4	4	10	13	3	2	49	16	5	3	6	16	4	8	54	13	3	9 12 13 1 1.4								
28	13	1	4	47	12	10	3	23	16	1	3	42	15	10	9	32	12	10	9 50 12 6 2.4								
5	12	6	5	24	12	3	4	0	15	6	4	18	15	3	10	8	12	2	10 27 11 10 3.4								
42	12	0	6	1	11	8	4	37	14	11	4	56	14	7	10	46	11	6	11 7 11 1 4.4								
20	11	5	6	39	11	1	5	15	14	3	5	35	13	10	11	27	10	8	11 50 10 3 5.4								
1	10	9	7	25	10	4	5	58	13	5	6	21	13	0	—	—	—	—	0 13 9 10 6.4								
50	9	11	8	19	9	7	6	45	12	8	7	14	12	4	0	37	9	6	1 4 9 3 7.4								
52	9	5	9	27	9	4	7	46	12	1	8	20	12	0	1	37	9	1	2 11 8 11 8								
6	9	4	10	44	9	6	8	59	11	11	9	39	12	1	2	51	8	11	3 35 8 11 9.4								
19	9	9	11	50	10	0	10	13	12	3	10	43	12	7	4	12	9	1	4 44 9 4 10.4								
—	—	—	0	19	10	4	11	12	12	11	11	39	13	4	5	14	9	7	5 41 10 0 11.4								
46	10	9	1	9	11	1	—	—	—	—	0	3	13	9	6	5	10	6	6 26 11 0 12.4								
Spring } Tide.							6 ^h . 8 ^h .							8 ^h . 2 ^h .							6 ^h . 7 ^h .						

Equation of Time at Noon.

A.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
2		9	1 41		17	0 24		25	2 4	
44		10	1 24		18	0 38		26	2 14	
26		11	1 8		19	0 51		27	2 24	
8		12	0 52		20	1 4		28	2 34	
50		13	0 36		21	1 17		29	2 43	
33		14	0 21		22	1 29		30	2 52	
15		15	0 5		23	1 41				
58		16	0 9	Add.	24	1 53				

High Water are given Mean Time at Place; if Greenwich or Railway Time be required,—for
 NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

APRIL, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.
W.	1	10 14	10 6	8 9	10 26	9 0	9 28	22 6	9 47	23 5	4 3	17 7	4 26	18 7
Th.	2	11 0	10 43	9 2	11 2	9 4	10 24	2	10 18	24 9	4 45	19 1	5 5	19 6
F.	3	11 48	11 22	9 5	11 41	9 7	10 35	25 3	10 54	25 9	5 26	20 3	5 46	20 7
S.	4	morn.	—	—	0 1	9 2	11 13	26 2	11 33	26 7	6 5	21 2	6 24	21 7
●	5	0 38	0 21	9 10	0 39	9 11	11 51	26 9	—	—	6 42	21 9	7 1	21 4
M.	6	1 32	0 59	9 11	1 19	10 0	10 26	10 0	0 29	26 10	7 20	21 9	7 39	21 4
Tu.	7	2 28	1 39	9 11	1 58	9 11	0 49	26 8	1 9	26 4	7 59	21 3	8 21	20 7
W.	8	3 27	2 19	9 10	2 41	9 9	1 30	25 9	1 51	25 2	8 43	20 5	9 5	19 7
Th.	9	4 27	3 3	9 6	3 26	9 4	2 13	24 6	2 37	23 9	9 28	19 1	9 54	18 7
F.	10	5 26	3 53	9 2	4 21	9 0	3 5	23 0	3 32	22 2	10 20	17 9	10 48	17 3
S.	11	6 23	4 53	8 9	5 29	8 7	4 7	21 6	4 46	20 11	11 17	16 5	11 52	16 0
●	12	7 18	6 8	8 6	6 50	8 5	5 29	20 8	6 17	20 10	—	—	0 31	16 4
M.	13	8 10	7 31	8 5	8 9	8 7	7 12	21 3	7 38	21 9	1 15	16 4	1 58	16 1
Tu.	14	9 0	8 43	8 10	9 15	9 0	8 12	22 6	8 40	23 3	2 35	17 5	3 10	18 7
W.	15	9 48	9 44	9 2	10 11	9 4	9 7	23 11	9 31	24 7	3 41	18 10	4 10	19 7
Th.	16	10 36	10 34	9 5	10 56	9 6	9 53	25 2	10 13	25 6	4 36	20 0	5 0	20 5
F.	17	11 24	11 18	9 7	11 40	9 8	10 33	25 10	10 53	26 0	5 23	20 9	5 45	20 1
S.	18	0 12	—	—	0 1	9 9	11 13	26 1	11 32	26 1	6 5	21 1	6 23	21 1
●	19	1 2	0 20	9 9	0 38	9 9	11 50	26 0	—	—	6 41	21 0	6 59	20 7
M.	20	1 52	0 57	9 8	1 16	9 7	0 8	25 9	0 27	25 6	7 17	20 6	7 35	20 4
Tu.	21	2 42	1 34	9 6	1 52	9 5	0 45	25 1	1 3	24 7	7 52	19 9	8 10	19 4
W.	22	3 32	2 9	9 4	2 27	9 2	1 20	24 1	1 37	23 6	8 28	18 10	8 47	18 7
Th.	23	4 20	2 45	9 0	3 3	8 10	1 55	22 10	2 13	22 3	9 5	17 9	9 23	17 7
F.	24	5 8	3 22	8 9	3 42	8 7	2 32	21 7	2 53	21 0	9 42	16 8	10 2	16 4
S.	25	5 53	4 4	8 6	4 28	7 4	3 15	20 4	3 40	19 10	10 23	15 8	10 47	15 0
●	26	6 38	4 56	8 2	5 26	8 1	4 11	19 5	4 44	19 11	11 13	14 10	11 45	14 7
M.	27	7 22	6 1	8 0	6 39	8 0	5 23	19 1	6 5	19 3	—	—	0 20	14 4
Tu.	28	8 6	7 15	8 1	7 48	8 2	6 44	19 8	7 17	20 2	0 56	15 0	1 33	15 1
W.	29	8 51	8 20	8 4	8 49	8 6	7 48	20 10	8 17	21 6	2 9	15 11	2 41	16 7
Th.	30	9 37	9 16	8 9	9 41	8 11	8 41	22 3	9 4	23 1	3 11	17 3	3 37	18 7
Half Mean Spring Range.			4 ^{ft.} 10 ^{in.}				13 ^{ft.} 0 ^{in.}				10 ^{ft.} 6 ^{in.}			
Phases of the Moon.							Moon's Declination at Noon.							
			D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°
Full	- - - -		4	4	9	Morning.	1	3	N. 39	9	21	8. 38	17	11 N. 9
Last Quarter	- - - -		11	1	23	Morning.	2	18	12	10	19	55	18	15 6
New	- - - -		18	3	5	Morning.	3	6	6	11	16	58	19	18 15
First Quarter	- - - -		26	4	8	Morning.	4	10	49	12	13	4	20	20 29
							5	15	3	13	8	28	21	21 43
In Perigee	- - - -		9	5	0	Morning.	6	18	31	14	3	29	22	21 54
In Apogee	- - - -		24	9	0	Morning.	7	20	54	15	1N. 37		23	21 5
							8	21	58	16	6	35	24	19 20

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 GREENOCK add 19 m. | LIVERPOOL add 11 m. | PEMBROKE add 20 m.

APRIL, 1863.

WESTON-SUPER-MARE.					HOLYHEAD.					KINGSTOWN.					C's AGE AT NOON.				
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.							
Time. H. M. F. I.	Height	Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.						
1 4 41 31 7		5 5 32 11		8 24 13 11		8 42 14 5		9 18 9 9		9 40 10 0		12.9							
2 5 26 34 1		5 46 35 2		8 57 14 11		9 13 15 3		9 56 10 3		10 13 10 6		13.9							
3 6 7 36 0		6 28 36 10		9 31 15 7		9 48 15 11		10 29 10 8		10 46 10 11		14.9							
4 6 47 37 6		7 7 37 11		10 6 16 2		10 23 16 4		11 3 11 1		11 21 11 2		0							
5 7 26 38 4		7 45 38 6		10 40 16 6		10 57 16 6		11 39 11 3		11 58 11 2		16.9							
6 8 3 38 5		8 22 38 3		11 15 16 5		11 35 16 4		— — — —		0 18 11 2		17.9							
7 8 41 37 11		9 1 37 4		11 56 16 1		— — — —		0 38 11 1		0 59 10 11		18.9							
8 9 21 36 8		9 41 35 9		0 19 15 10		0 43 15 6		1 22 10 9		1 45 10 6		19.9							
9 10 2 34 8		10 24 33 6		1 8 15 1		1 35 14 7		2 8 10 3		2 35 10 0		20.9							
10 10 46 32 3		11 15 31 2		2 5 14 2		2 35 13 9		3 4 9 9		3 34 9 7		21.9							
11 11 49 30 2		— — — —		3 12 13 4		3 54 13 1		4 11 9 4		4 52 9 1		0							
12 0 28 29 8		1 9 29 7		4 38 13 0		5 23 13 1		5 32 9 0		6 12 9 1		23.9							
1 1 52 30 0		2 31 30 8		6 2 13 4		6 37 13 7		6 49 9 3		7 24 9 6		24.9							
2 3 8 31 7		3 45 32 7		7 8 14 0		7 36 14 5		7 56 9 9		8 27 9 11		25.9							
3 4 19 33 7		4 50 34 8		8 3 14 10		8 27 15 2		8 56 10 2		9 24 10 5		26.9							
4 5 17 35 7		5 41 36 3		8 48 15 6		9 8 15 9		9 48 10 7		10 7 10 9		27.9							
5 6 4 36 10		6 26 37 1		9 28 15 11		9 47 16 1		10 25 10 11		10 44 11 0		28.9							
6 6 47 37 3		7 6 37 3		10 5 16 2		10 22 16 1		11 2 11 0		11 19 11 0		0							
7 7 25 37 3		7 43 36 11		10 38 16 0		10 55 15 10		11 37 10 11		11 56 10 10		1.4							
8 8 1 36 6		8 18 36 0		11 13 15 7		11 30 15 4		— — — —		0 16 10 8		2.4							
9 8 35 35 5		8 51 34 10		11 49 15 1		— — — —		0 34 10 6		0 52 10 4		3.4							
10 9 8 34 2		9 24 33 5		0 8 14 9		0 28 14 5		1 11 10 2		1 30 9 11		4.4							
11 9 40 32 5		9 56 31 6		0 49 14 1		1 9 13 8		1 49 9 9		2 9 9 6		5.4							
12 10 12 30 7		10 30 29 7		1 31 13 4		1 54 12 11		2 31 9 4		2 53 9 1		6.4							
1 10 50 28 9		11 16 28 1		2 18 12 7		2 45 12 4		3 17 8 11		3 44 8 9		7.4							
2 11 46 27 7		— — — —		3 18 12 1		3 52 12 0		4 16 8 7		4 50 8 6		0							
3 0 21 27 4		0 58 27 5		4 32 12 0		5 12 12 1		5 25 8 6		6 1 8 7		9.4							
4 1 35 27 10		2 9 28 5		5 47 12 4		6 17 12 8		6 34 8 9		7 4 8 11		10.4							
5 2 42 29 3		3 15 30 1		6 46 13 0		7 13 13 5		7 33 9 2		8 2 9 5		11.4							
6 3 46 31 2		4 15 32 3		7 37 13 10		8 0 14 3		8 28 9 8		8 53 9 11		12.4							
Mean Spring } Range. }					18ft. 7in.					8ft. 0in.					5ft. 6in.				

Equation of Time at Noon.

M.	S.		M. D.	M.	S.		M. D.	M.	S.		M. D.	M.	S.	
4	2	Sub.	9	1	41	Sub.	17	0	24	Add.	25	2	4	Add.
3	44		10	1	24		18	0	38		26	2	14	
3	26		11	1	8		19	0	51		27	2	24	
3	8		12	0	52		20	1	4		28	2	34	
2	50		13	0	36		21	1	17		29	2	43	
2	33		14	0	21		22	1	29		30	2	52	
2	15		15	0	5		23	1	41					
1	58		16	0	9	Add.	24	1	53					

as of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
STON-SUPRE-MARE add 12 m. **HOLYHEAD** add 18 m. **KINGSTOWN** subtract 1 m. for Dublin Time.

APRIL, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	10 14	8 58	8 7	9 17	8 10	6 9	6 8	6 27	6 11	3 28	9 5	3 45	5
Th.	2	11 0	9 33	9 0	9 49	9 2	6 43	7 2	7 1	7 4	3 59	10 3	4 15	10
F.	3	11 48	10 6	9 4	10 24	9 6	7 19	7 6	7 38	7 8	4 33	10 10	4 51	11
S.	4	morn.	10 42	9 7	11 0	9 7	7 56	7 10	8 14	7 11	5 10	11 4	5 30	11
●	5	0 38	11 18	9	11 35	9 7	8 31	8 0	8 48	8 0	5 48	11 7	6 5	11
M.	6	1 32	11 53	9 7	—	—	9 5	7 11	9 23	7 9	6 23	11 6	6 43	11
Tu.	7	2 28	0 14	9 7	0 35	9 6	9 42	7 7	10 2	7 5	7 4	11 2	7 26	10
W.	8	3 27	0 58	5	1 21	9 3	10 24	7 3	10 46	7 0	7 48	10 6	8 10	10
Th.	9	4 27	1 47	2	2 16	9 0	11 14	6 8	11 51	6 4	8 36	9 9	9 6	5
F.	10	5 26	2 46	8	3 17	8 7	—	—	0 30	6 0	9 41	9 1	10 21	8
S.	11	6 23	3 54	8 5	4 33	8 4	1 15	5 10	2 4	5 9	11 3	8 8	11 46	8
●	12	7 18	5 13	8 3	5 53	8 3	2 50	5 10	3 31	6 1	—	—	0 27	8
M.	13	8 10	6 33	8 3	7 10	4	4 6	6 4	4 36	6 6	1 7	8 10	1 43	5
Tu.	14	9 0	7 42	8 5	8 10	8 8	5 1	6 9	5 25	6 11	2 15	9 4	2 42	9
W.	15	9 48	8 37	11	9 1	9 1	5 48	7 1	6 11	7 4	3 8	10 0	3 30	10
Th.	16	10 36	9 23	9 3	9 44	9 4	6 34	7 6	6 55	7 7	3 50	10 8	4 10	10
F.	17	11 24	10 4	9 5	10 23	9 6	7 16	7 8	7 37	7 9	4 30	11 1	4 50	11
S.	18	0 12	10 41	9 6	10 58	9 6	7 56	7 9	8 13	7 9	5 10	11 4	5 28	11
●	19	1 21	11 16	9 5	11 33	9 4	8 29	7 9	8 45	7 7	5 46	11 3	6 3	11
M.	20	1 52	11 51	9 3	—	—	9 2	7 5	9 19	7 3	6 21	10 11	6 39	10
Tu.	21	2 42	0 9	9 2	0 28	9 1	9 36	7 1	9 52	6 10	6 57	10 5	7 15	10
W.	22	3 32	0 47	9 0	1 6	8 11	10 9	6 8	10 27	6 5	7 33	9 9	7 51	9
Th.	23	4 20	1 27	10	1 49	8 8	10 47	6 2	11 13	5 11	8 10	9 1	8 32	8
F.	24	5 8	2 12	8 6	2 36	8 4	11 40	5 8	—	—	8 56	8 6	9 23	8
S.	25	5 53	3 0	2	3 27	8 1	0 12	5 5	0 46	5 3	9 53	8 0	10 27	7
●	26	6 38	3 58	8 0	4 31	7 11	1 24	5 3	2 3	5 2	11 2	7 10	11 39	7
M.	27	7 22	5 4	7 10	5 42	7 10	2 43	5 3	3 20	5 6	—	—	0 16	11
Tu.	28	8 6	6 17	7 11	6 49	8 0	3 52	5 9	4 19	6 0	0 51	8 2	1 22	8
W.	29	8 51	7 20	8 1	7 47	8 3	4 43	6 2	5 5	6 5	1 52	8 7	2 20	8
Th.	30	9 37	8 11	8 5	8 34	8	5 25	6 7	5 45	6 10	2 43	9 3	3 5	9
Half Mean Spring Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°
Full	—	—	4	4	9	Morning.	1	3	N.39	9	21	S.38	17	11
Last Quarter	—	—	11	1	23	Morning.	2	1	S.12	10	19	55	18	15
New	—	—	18	3	5	Morning.	3	6	6	11	16	58	19	18
First Quarter	—	—	26	4	8	Morning.	4	10	49	12	13	4	20	20
							5	15	3	13	8	28	21	21
In Perigee	—	—	9	5	0	Morning.	6	18	31	14	3	29	22	21
In Apogee	—	—	24	9	0	Morning.	7	20	54	15	1	N.37	23	21
							8	21	58	16	6	35	24	19

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,
 BELFAST subtract 3 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

APRIL, 1863.

GALWAY.					QUEENSTOWN.					WATERFORD.					C's AGE AT NOON.
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			
Time.	Height.	Time.	Height.		Time.	Height.	Time.	Height.		Time.	Height.	Time.	Height.		
H. M. F. I.		H. M. F. I.			H. M. F. I.		H. M. F. I.			H. M. F. I.		H. M. F. I.		D.	
2 42 12 4		3 1 12 10			2 58 10 0		3 20 10 5			3 11 10 10		3 34 11 2		12.9	
3 19 13 4		3 35 13 9			3 37 10 9		3 56 11 1			3 55 11 6		4 15 11 10		13.9	
3 53 14 2		4 11 14 7			4 15 11 4		4 34 11 7			4 37 12 1		4 57 12 4		14.9	
4 29 14 11		4 47 15 2			4 53 11 10		5 13 12 0			5 16 12 6		5 35 12 7		○	
5 5 15 4		5 26 15 4			5 32 12 1		5 52 12 1			5 51 12 9		6 12 12 10		16.9	
5 44 15 4		6 4 15 2			6 11 12 1		6 31 12 0			6 31 12 10		6 52 12 9		17.9	
6 25 15 0		6 47 14 8			6 51 11 11		7 12 11 8			7 12 12 8		7 33 12 6		18.9	
7 10 14 3		7 33 13 10			7 34 11 5		7 56 11 2			7 54 12 4		8 15 12 1		19.9	
8 0 13 4		8 29 12 9			8 19 10 10		8 44 10 5			8 37 11 9		9 1 11 5		20.9	
8 59 12 1		9 33 11 8			9 11 10 1		9 40 9 9			9 25 11 1		9 56 10 9		21.9	
0 12 11 4		10 54 11 3			10 13 9 6		10 53 9 5			10 35 10 5		11 14 10 3		☾	
1 38 11 4		— —			11 35 9 5		— —			11 53 10 2		— —		23.9	
0 19 11 7		0 55 11 11			0 17 9 6		0 55 9 9			0 30 10 3		1 6 10 6		24.9	
1 26 12 4		1 54 12 10			1 32 10 0		2 6 10 4			1 41 10 9		2 16 11 1		25.9	
2 21 13 3		2 46 13 8			2 36 10 8		3 4 10 11			2 49 11 5		3 19 11 9		26.9	
3 10 14 0		3 30 14 4			3 28 11 3		3 51 11 5			3 46 12 0		4 10 12 2		27.9	
3 50 14 7		4 10 14 9			4 13 11 7		4 33 11 9			4 34 12 4		4 56 12 5		28.9	
4 29 14 10		4 46 14 10			4 53 11 10		5 12 11 10			5 16 12 5		5 34 12 5		●	
5 4 14 10		5 23 14 8			5 31 11 9		5 50 11 8			5 51 12 5		6 10 12 4		1.4	
5 42 14 5		6 0 14 2			6 9 11 6		6 26 11 4			6 29 12 2		6 47 12 1		2.4	
6 18 13 10		6 36 13 6			6 44 11 2		7 2 10 11			7 5 11 11		7 23 11 9		3.4	
6 55 13 2		7 14 12 9			7 20 10 8		7 38 10 5			7 40 11 6		7 57 11 4		4.4	
7 34 12 4		7 56 11 10			7 55 10 1		8 13 9 10			8 14 11 1		8 32 10 9		5.4	
8 18 11 5		8 42 10 11			8 32 9 7		8 53 9 3			8 50 10 7		9 8 10 3		6.4	
9 7 10 6		9 37 10 3			9 15 9 0		9 41 8 10			9 31 10 1		10 0 9 10		7.4	
0 10 10 2		10 47 10 2			10 10 8 9		10 46 8 8			10 33 9 7		11 7 9 6		☽	
1 27 10 4		— —			11 24 8 9		— —			11 42 9 6		— —		9.4	
0 3 10 6		0 34 10 10			0 1 8 10		0 34 9 1			0 15 9 7		0 45 9 10		10.4	
1 4 11 3		1 31 11 8			1 6 9 4		1 38 9 7			1 16 10 0		1 46 10 4		11.4	
1 54 12 2		2 17 12 8			2 7 9 11		2 33 10 3			2 16 10 9		2 44 11 0		12.4	
Mean Spring } 7ft. 5in.					5ft. 10in.					6ft. 2in.					
Age.															

Equation of Time at Noon.

M. S.		M.D.	M. S.		M.D.	M. S.		M.D.	M. S.	
4 2	Sub.	9	1 41	Sub.	17	0 24	Add.	25	2 4	Add.
3 44		10	1 24		18	0 38		26	2 14	
3 26		11	1 8		19	0 51		27	2 24	
3 8		12	0 52		20	1 4		28	2 34	
2 50		13	0 36		21	1 17		29	2 43	
2 33		14	0 21		22	1 29		30	2 52	
2 15		15	0 5		23	1 41				
1 58		16	0 9	Add.	24	1 53				

s of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.

TIDE TABLES FOR THE

MAY, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.
F.	1	10 27	1 49	16 10	2 9	17 6	3 34	14 5	3 58	14 5	9 43	11 9	10 4	12 4
S.	2	11 19	2 29	18 2	2 49	18 9	4 21	14 11	4 43	15 1	10 24	12 3	10 45	12 3
M.	3	morn.	3 9	19 2	3 30	19 6	5 5	15 5	5 26	15 7	11 5	12 8	11 25	12 8
Tu.	4	0 16	3 51	19 8	4 14	19 9	5 48	15 9	6 9	15 10	11 46	12 11	—	—
W.	5	1 15	4 35	19 9	4 56	19 7	6 31	15 10	6 53	16 0	0 10	13 0	0 33	13 0
Th.	6	2 17	5 19	19 4	5 42	19 1	7 13	15 7	7 34	15 10	0 56	12 10	1 19	12 3
F.	7	3 18	6 7	18 8	6 33	18 1	7 56	15 2	8 21	15 5	1 44	12 8	2 8	12 0
S.	8	4 18	6 59	17 6	7 28	16 10	8 45	14 7	9 10	14 10	2 34	12 3	2 59	12 3
M.	9	5 14	7 58	16 2	8 29	15 7	9 37	13 9	10 6	14 1	3 28	11 8	3 56	11 5
Tu.	10	6 7	9 2	15 2	9 36	15 0	10 37	13 0	11 10	13 6	4 26	11 2	4 58	10 4
W.	11	6 57	10 12	14 11	10 49	15 0	11 45	12 7	—	—	5 30	10 9	6 3	10 9
Th.	12	7 45	11 25	15 2	12 0	15 6	0 25	13 3	1 2	12 9	6 38	10 7	7 12	10 9
F.	13	8 33	—	—	0 30	15 10	1 38	13 7	2 13	13 5	7 47	11 0	8 30	12 3
S.	14	9 20	0 59	16 3	1 27	16 7	2 45	14 2	3 13	14 1	8 50	11 5	9 19	12 11
M.	15	10 7	1 51	17 0	2 14	17 4	3 38	14 6	4 4	14 6	9 45	11 9	10 9	12 11
Tu.	16	10 56	2 35	17 7	2 55	17 11	4 27	14 8	4 48	14 10	10 31	12 0	10 51	12 3
W.	17	11 45	3 15	18 1	3 35	18 0	5 10	14 11	5 29	15 0	11 11	12 1	11 31	12 3
Th.	18	0 235	3 54	17 11	4 14	17 10	5 48	14 11	6 7	15 1	11 50	12 1	—	—
F.	19	1 25	4 33	17 8	4 49	17 6	6 25	14 9	6 41	15 0	0 10	12 0	0 30	11 5
S.	20	2 14	5 5	17 3	5 22	17 0	6 56	14 4	7 12	14 8	0 48	11 10	1 5	11 5
M.	21	3 2	5 40	16 9	5 59	16 6	7 28	13 11	7 43	14 3	1 23	11 7	1 42	11 5
Tu.	22	3 48	6 17	16 2	6 36	15 9	8 0	13 3	8 16	13 9	1 59	11 5	2 18	11 5
W.	23	4 33	6 55	15 4	7 18	15 0	8 32	12 8	8 49	13 2	2 37	11 1	2 56	10 9
Th.	24	5 16	7 42	14 7	8 5	14 2	9 12	12 1	9 34	12 7	3 18	10 9	3 40	10 9
F.	25	6 0	8 29	13 11	8 56	13 9	9 57	11 8	10 23	12 3	4 2	10 5	4 26	10 9
S.	26	6 43	9 26	13 8	10 2	13 10	10 49	11 6	11 20	12 1	4 52	10 2	5 20	10 9
M.	27	7 28	10 35	14 0	11 7	14 3	11 58	11 9	—	—	5 54	10 0	6 25	10 9
Tu.	28	8 14	11 38	14 7	—	—	0 37	12 6	1 12	12 6	6 55	10 3	7 25	10 9
W.	29	9 5	0 9	15 1	0 37	15 7	1 47	13 2	2 22	13 3	7 57	10 9	8 27	11 5
Th.	30	9 59	1 4	16 2	1 31	16 9	2 50	13 9	3 18	14 0	8 55	11 5	9 23	11 5
F.	31	10 57	1 56	17 6	2 21	18 1	3 45	14 5	4 12	14 9	9 50	12 0	10 17	12 3
Half Mean Spring Range.			9 ⁿ . 6 ⁱⁿ .				7 ⁿ . 9 ⁱⁿ .				6 ⁿ . 4 ⁱⁿ .			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°
Full - - - - 3 2 52 Afternoon.							1	9	8. 3	9	13	8. 53	17	19 N. 54
Last Quarter - 10 7 15 Morning.							2	13	30	10	9	25	18	21 24
New - - - - 17 4 48 Afternoon.							3	17	19	11	4	31	19	21 54
First Quarter - 25 8 47 Afternoon.							4	20	8	12	0	N. 30	20	21 22
							5	21	41	13	5	25	21	19 54
							6	21	46	14	10	0	22	17 34
In Perigee - - 6 6 0 Morning.							7	20	21	15	14	4	23	14 30
In Apogee - - 22 2 0 Morning.							8	17	39	16	17	25	24	10 50

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,
 BREST add 28 m. DEVONPORT add 17 m. PORTSMOUTH add 4 m.

MAY, 1863.

MONTH DAY.	DOVER.								SHEERNESS.								LONDON.								C's AGE AT NOON.
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D						
1	9 5 17 0	9 27 17 6	11 2 14 9	11 23 15 1	0 6 16 10	0 28 17 2	13.4																		
2	9 48 17 11	10 11 18 4	11 42 15 5	— —	0 50 17 7	1 11 18 0	14.4																		
3	10 33 18 8	10 54 18 11	0 2 15 9	0 22 16 0	1 33 18 5	1 53 18 9	0													○					
4	11 19 19 1	11 43 19 2	0 42 16 2	1 2 16 4	2 13 19 0	2 33 19 3	16.4																		
5	— —	0 7 19 3	1 22 16 6	1 45 16 6	2 54 19 5	3 16 19 7	17.4																		
6	0 30 19 2	0 56 19 0	2 7 16 5	2 28 16 4	3 37 19 7	3 58 19 6	18.4																		
7	1 22 18 10	1 48 18 6	2 50 16 3	3 12 16 0	4 20 19 5	4 44 19 3	19.4																		
8	2 14 18 2	2 41 17 8	3 37 15 9	4 3 15 5	5 8 19 0	5 33 18 8	20.4																		
9	3 9 17 3	3 37 16 9	4 29 15 0	4 58 14 8	5 59 18 3	6 28 17 11	21.4																		
10	4 7 16 3	4 36 15 10	5 30 14 4	6 3 14 1	6 58 17 6	7 30 17 2	0													☾					
11	5 5 15 6	5 34 15 5	6 39 13 10	7 16 13 9	8 5 16 11	8 43 16 9	23.4																		
12	6 5 15 5	6 38 15 7	7 54 13 9	8 30 13 10	9 20 16 8	9 54 16 7	24.4																		
13	7 13 15 11	7 45 16 3	9 4 14 1	9 37 14 4	10 30 16 9	11 6 16 10	25.4																		
14	8 14 16 7	8 42 16 10	10 6 14 7	10 34 14 10	11 37 17 1	— —	26.4																		
15	9 8 17 1	9 32 17 4	11 1 15 0	11 24 15 2	0 4 17 4	0 30 17 6	27.4																		
16	9 55 17 6	10 18 17 8	11 46 15 4	— —	0 53 17 9	1 17 17 11	28.4																		
17	10 39 17 9	11 1 17 9	0 8 15 5	0 28 15 6	1 38 18 1	2 0 18 3	0													●					
18	11 23 17 9	11 43 17 8	0 48 15 7	1 8 15 7	2 19 18 4	2 39 18 5	0.8																		
19	— —	0 3 17 7	1 26 15 6	1 46 15 5	2 57 18 5	3 15 18 5	1.8																		
20	0 22 17 5	0 40 17 3	2 4 15 4	2 20 15 2	3 32 18 4	3 49 18 3	2.8																		
21	1 0 17 1	1 20 16 11	2 36 15 0	2 52 14 11	4 6 18 1	4 25 17 11	3.8																		
22	1 39 16 9	1 58 16 6	3 10 14 9	3 28 14 6	4 43 17 10	5 0 17 8	4.8																		
23	2 18 16 3	2 38 16 0	3 47 14 4	4 6 14 1	5 19 17 5	5 37 17 2	5.8																		
24	2 59 15 9	3 21 15 5	4 26 13 10	4 48 13 8	5 56 17 0	6 17 16 9	6.8																		
25	3 43 15 2	4 6 14 11	5 12 13 6	5 37 13 3	6 42 16 6	7 5 16 4	0													☽					
26	4 30 14 8	4 56 14 6	6 4 13 2	6 34 13 0	7 30 16 2	7 59 16 0	8.8																		
27	5 27 14 6	5 55 14 7	7 6 13 0	7 43 13 1	8 32 15 11	9 7 16 0	9.8																		
28	6 21 14 10	6 51 15 2	8 17 13 3	8 47 13 6	9 40 16 1	10 11 16 2	10.8																		
29	7 23 15 7	7 52 16 1	9 16 13 10	9 45 14 1	10 43 16 4	11 14 16 7	11.8																		
30	8 20 16 6	8 47 17 0	10 13 14 5	10 39 14 9	11 41 16 11	— —	12.8																		
31	9 13 17 6	9 41 17 11	11 4 15 1	11 28 15 5	0 7 17 3	0 33 17 7	13.8																		

Half Mean Spring } 9ft. 4in.
Range.

8ft. 0in.

9ft. 7in.

Equation of Time at Noon.

D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
	3	0		9	3	44		17	3	52		25	3	23	
	3	7		10	3	47		18	3	50		26	3	17	
	3	14		11	3	50		19	3	48		27	3	11	
	3	21		12	3	52		20	3	45		28	3	4	
	3	27		13	3	53		21	3	41		29	2	57	
	3	32		14	3	53		22	3	38		30	2	49	
	3	37		15	3	53		23	3	33		31	2	41	
	3	41		16	3	53		24	3	28					

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

MAY, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.															
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.											
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.														
			H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.								
F.	1	10 27	10	11	10	9	10	34	11	0	4	31	18	10	4	52	19	5	1	21	12	8	1	44	13									
S.	2	11 19	10	52	11	3	11	13	11	6	5	11	19	11	5	29	20	4	2	5	13	5	2	26	13									
S.	3	morn.	11	35	11	8	11	55	11	9	5	50	20	8	6	12	20	11	2	47	14	1	3	7	14									
M.	4	0 16	—	—	—	—	0	15	11	10	6	33	21	2	6	54	21	4	3	25	14	6	3	45	14									
Tu.	5	1 15	0	36	11	10	0	58	11	10	7	17	21	5	7	39	21	5	4	7	14	10	4	29	14									
W.	6	2 17	1	20	11	9	1	42	11	8	8	1	21	4	8	23	21	2	4	51	14	8	5	13	14									
Th.	7	3 18	2	5	11	6	2	30	11	5	8	47	20	10	9	13	20	5	5	38	14	3	6	4	13									
F.	8	4 18	2	56	11	3	3	21	11	0	9	39	19	10	10	5	19	4	6	31	13	6	6	59	13									
S.	9	5 14	3	46	10	10	4	14	10	7	10	34	18	10	11	8	18	4	7	30	12	9	8	8	12									
S.	10	6 7	4	43	10	5	5	15	10	3	11	45	17	11	—	—	—	—	8	35	12	2	9	10	11									
M.	11	6 57	5	48	10	2	6	22	10	2	0	24	17	7	1	0	17	4	9	47	11	9	10	22	11									
Tu.	12	7 49	7	1	10	2	7	38	10	3	1	32	17	4	2	3	17	5	10	56	11	9	11	27	11									
W.	13	8 33	8	12	10	4	8	44	10	6	2	34	17	9	3	5	18	2	11	57	12	2	—	—	—									
Th.	14	9 20	9	13	10	8	9	42	10	10	3	35	18	7	4	2	19	0	0	25	12	6	0	52	12									
F.	15	10 7	10	10	11	0	10	35	11	1	4	30	19	3	4	53	19	6	1	20	13	0	1	46	13									
S.	16	10 56	10	58	11	2	11	20	11	3	5	15	19	8	5	36	19	10	2	10	13	4	2	32	13									
S.	17	11 45	11	41	11	4	—	—	—	—	5	57	19	11	6	18	19	11	2	53	13	6	3	12	13									
M.	18	0 35	0	1	11	4	0	21	11	3	6	39	19	11	6	58	19	10	3	31	13	8	3	50	13									
Tu.	19	1 25	0	39	11	2	0	58	11	1	7	17	19	9	7	36	19	8	4	8	13	8	4	27	13									
W.	20	2 14	1	17	11	0	1	34	10	11	7	53	19	6	8	9	19	4	4	43	13	5	4	59	13									
Th.	21	3 2	1	51	10	9	2	9	10	8	8	26	19	1	8	45	18	10	5	17	13	0	5	36	12									
F.	22	3 48	2	28	10	6	2	46	10	5	9	4	18	6	9	23	18	2	5	56	12	6	6	15	12									
S.	23	4 33	3	5	10	3	3	24	10	2	9	42	17	10	10	1	17	6	6	35	12	0	6	57	11									
S.	24	5 16	3	43	10	0	4	4	9	11	10	24	17	3	10	50	16	11	7	20	11	8	7	44	11									
M.	25	6 0	4	26	9	10	4	51	9	9	11	18	16	8	11	48	16	6	8	10	11	3	8	36	11									
Tu.	26	6 43	5	15	9	8	5	42	9	8	—	—	—	—	0	19	16	4	9	5	11	0	9	37	11									
W.	27	7 28	6	12	9	8	6	50	9	9	0	50	16	3	1	23	16	4	10	13	11	0	10	44	11									
Th.	28	8 14	7	25	9	10	7	54	10	0	1	52	16	6	2	19	16	10	11	11	11	4	11	38	11									
F.	29	9 5	8	23	10	2	8	53	10	4	2	45	17	3	3	13	17	10	—	—	—	0	0	5	11									
S.	30	9 59	9	20	10	7	9	47	10	10	3	41	18	5	4	8	18	11	0	32	12	4	0	58	12									
S.	31	10 57	10	14	11	0	10	39	11	—	4	33	19	5	4	56	19	11	1	24	13	1	1	51	13									
Half Mean Spring Range.			5ft. 9in.								10ft. 5in.								7ft. 2in.															
Phases of the Moon.												Moon's Declination at Noon.																						
D. H. M.												M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'		
Full - - - - - 3 2 52 Afternoon.												1	9	8. 3	9	13	8. 53	17	19	N. 54	25	6	N.	25	6	N.	25	6	N.	25	6	N.	25	6
Last Quarter - 10 7 15 Morning.												2	13	30	10	9	25	18	21	24	26	2		26	2		26	2		26	2		26	2
New - - - - - 17 4 48 Afternoon.												3	17	19	11	4	31	19	21	54	27	2		27	2		27	2		27	2		27	2
First Quarter 25 8 47 Afternoon.												4	20	8	12	0	N. 30	20	21	22	28	7		28	7		28	7		28	7		28	7
												5	21	41	13	5	25	21	19	54	29	11		29	11		29	11		29	11		29	11
In Perigee - - 6 6 0 Morning.												6	21	46	14	10	0	22	17	34	30	15		30	15		30	15		30	15		30	15
In Apogee - - 22 2 0 Morning.												7	20	21	15	14	4	23	14	30	31	19		31	19		31	19		31	19		31	19
												8	17	39	16	17	25	24	10	50														

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, HARWICH subtract 8 m. HULL add 1 m. SUNDERLAND add 6 m.

MAY, 1863.

NORTH SHIELDS.						LEITH.						THURSO.						C's AGE AT NOON.	
MORNING.		AFTERNOON.				MORNING.		AFTERNOON.				MORNING.		AFTERNOON.					
Height. F. I.		Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.				D.
11	6	1	51	11	10	0	25	14	3	0	45	14	9	6	44	11	7	13.4	
12	3	2	29	12	8	1	4	15	3	1	24	15	8	7	18	12	7	14.4	
3	0	3	6	13	3	1	44	16	1	2	4	16	4	7	53	13	4	0	
3	5	3	46	13	7	2	24	16	7	2	43	16	9	8	31	13	8	16.4	
3	8	4	31	13	7	3	4	16	9	3	26	16	8	9	15	13	8	17.4	
3	5	5	17	13	2	3	48	16	6	4	11	16	3	10	1	13	3	18.4	
3	0	6	8	12	9	4	36	16	1	5	2	15	9	10	53	12	8	19.4	
2	5	7	1	12	1	5	29	15	5	5	57	15	0	11	49	11	10	20.4	
1	9	8	6	11	3	6	29	14	6	7	1	14	2	0	20	11	5	21.4	
10	11	9	20	10	9	7	37	13	10	8	14	13	6	1	27	10	9	(
10	8	10	34	10	9	8	52	13	5	9	29	13	4	2	44	10	4	23.4	
10	10	11	40	11	0	10	2	13	6	10	33	13	8	4	1	10	3	24.4	
—	—	0	11	11	2	11	4	13	10	11	32	14	1	5	6	10	6	25.4	
11	5	1	4	11	7	11	58	14	4	—	—	—	—	6	0	11	1	26.4	
11	9	1	52	11	11	0	23	14	7	0	46	14	10	6	45	11	8	27.4	
12	2	2	35	12	3	1	9	15	1	1	31	15	3	7	23	12	2	28.4	
12	5	3	12	12	6	1	51	15	6	2	10	15	7	7	59	12	7	●	
12	7	3	50	12	6	2	29	15	8	2	48	15	7	8	36	12	6	0.8	
12	5	4	28	12	4	3	5	15	6	3	23	15	4	9	12	12	3	1.8	
12	2	5	2	11	11	3	40	15	1	3	57	14	10	9	47	11	10	2.8	
11	9	5	40	11	7	4	15	14	8	4	34	14	6	10	25	11	5	3.8	
11	5	6	18	11	3	4	53	14	3	5	12	14	1	11	4	10	11	4.8	
8	1	6	58	10	10	5	33	13	10	5	55	13	7	11	47	10	4	5.8	
2	10	7	48	10	4	6	19	13	3	6	43	13	0	0	10	10	2	6.8	
5	10	8	44	9	11	7	10	12	10	7	39	12	8	1	1	9	9	7	
5	9	9	50	9	10	8	9	12	7	8	42	12	6	2	0	9	6	8.8	
25	9	10	56	10	1	9	19	12	7	9	51	12	9	3	12	9	6	9.8	
24	10	4	52	10	8	10	18	13	0	10	45	13	3	4	17	9	9	10.8	
—	—	0	20	10	11	11	13	13	7	11	39	13	11	5	15	10	2	11.8	
45	11	3	1	9	11	6	—	—	—	0	3	14	3	6	5	11	0	12.8	
33	11	10	1	57	12	3	0	27	14	9	0	51	15	2	6	49	12	0	13.8
Spring } 6ft. 8in.						8ft. 2in.						6ft. 7in.							

Equation of Time at Noon.

S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
0		9	3 44		17	3 52		25	3 23	
7		10	3 47		18	3 50		26	3 17	
14		11	3 50		19	3 48		27	3 11	
21		12	3 52		20	3 45		28	3 4	
27		13	3 53		21	3 41		29	2 57	
32		14	3 53		22	3 38		30	2 49	
37		15	3 53		23	3 33		31	2 41	
41		16	3 53		24	3 28				

of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required—for
NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

MAY, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.																														
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																										
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																													
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.																											
F.	1	10 27	10 4	9 1	10 25	9 3	9 25	23 9	9 44	24 5	4 2	18 9	4 25	19 4																																			
S.	2	11 19	10 46	9 5	11 8	9 6	10 3	25 0	10 23	25 7	4 49	20 0	5 13	20 4																																			
S.	3	morn.	11 30	9 8	11 52	9 9	10 44	25 11	11 4	26 3	5 35	20 11	5 56	21 1																																			
M.	4	0 16	—	—	0 14	9 10	11 25	26 7	11 48	26 8	6 17	21 6	6 39	21 1																																			
Tu.	5	1 15	0 37	9 11	1 0	9 11	—	—	0 11	26 9	7 1	21 8	7 23	21 1																																			
W.	6	2 17	1 23	9 11	1 46	9 11	0 33	26 7	0 56	26 4	7 46	21 3	8 10	21 1																																			
Th.	7	3 18	2 9	9 10	2 33	9 9	1 19	25 11	1 43	25 5	8 35	20 7	9 0	20 1																																			
F.	8	4 18	2 58	9 7	3 23	9 5	2 9	24 9	2 35	24 1	9 25	19 5	9 51	18 1																																			
S.	9	5 14	3 51	9 3	4 20	9 2	3 2	23 6	3 31	22 10	10 18	18 4	10 45	17 1																																			
S.	10	6 7	4 50	9 0	5 23	8 10	4 3	22 2	4 38	21 8	11 12	17 2	11 41	16 2																																			
M.	11	6 57	5 56	8 8	6 29	8 7	5 16	21 5	5 54	21 4	—	—	0 11	16 1																																			
Tu.	12	7 45	7 3	8 7	7 37	8 8	6 33	21 7	7 7	21 11	0 45	16 9	1 24	16 1																																			
W.	13	8 33	8 12	8 9	8 42	8 10	7 40	22 3	8 10	22 9	2 2	17 2	2 35	17 1																																			
Th.	14	9 20	9 12	9 0	9 40	9 1	8 37	23 2	9 3	23 7	3 7	18 1	3 37	18 1																																			
F.	15	10 7	10 6	9 2	10 29	9 2	9 26	23 11	9 48	24 3	4 5	18 10	4 31	19 1																																			
S.	16	10 56	10 52	9 3	11 15	9 3	10 9	24 5	10 29	24 7	4 55	19 5	5 19	19 1																																			
S.	17	11 45	11 36	9 3	11 58	9 4	10 50	24 8	11 10	24 8	5 41	19 9	6 2	19 1																																			
M.	18	0 35	—	—	0 18	9 4	11 30	24 8	11 49	24 7	6 21	19 10	6 40	19 1																																			
Tu.	19	1 25	0 37	9 4	0 57	9 4	—	—	0 8	24 5	6 58	19 8	7 15	19 1																																			
W.	20	2 14	1 15	9 3	1 31	9 3	0 25	24 3	0 42	24 0	7 32	19 2	7 49	18 1																																			
Th.	21	3 2	1 48	9 2	2 7	9 1	0 59	23 9	1 17	23 3	8 7	18 8	8 26	18 1																																			
F.	22	3 48	2 25	9 0	2 43	8 11	1 35	23 0	1 53	22 7	8 45	18 1	9 3	17 1																																			
S.	23	4 33	3 1	8 10	3 19	8 9	2 11	22 1	2 30	21 9	9 21	17 4	9 41	17 1																																			
S.	24	5 16	3 41	8 9	4 4	8 8	2 52	21 5	3 15	21 0	10 2	16 9	10 23	16 1																																			
M.	25	6 0	4 27	8 7	4 50	8 6	3 38	20 7	4 4	20 4	10 44	16 0	11 6	15 1																																			
Tu.	26	6 43	5 17	8 5	5 46	8 4	4 33	20 1	5 6	20 0	11 32	15 7	—	—																																			
W.	27	7 28	6 20	8 3	6 51	8 3	5 43	20 1	6 19	20 4	0 3	15 7	0 32	15 1																																			
Th.	28	8 14	7 21	8 4	7 50	8 5	6 50	20 9	7 20	21 3	1 3	16 0	1 38	16 1																																			
F.	29	9 5	8 20	8 7	8 49	8 9	7 49	21 10	8 16	22 5	2 12	16 10	2 43	17 1																																			
S.	30	9 59	9 17	8 11	9 44	9 1	8 42	23 1	9 7	23 9	3 13	18 0	3 42	18 1																																			
S.	31	10 57	10 11	9 3	10 38	9 5	9 31	24 5	9 55	25 0	4 10	19 4	4 39	19 1																																			
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.																																						
Phases of the Moon.																									Moon's Declination at Noon.																								
D. H. M.																									M.D. ° '																								
Full - - - - - 3 2 52 Afternoon.																									1 9 8. 3 9 13 8. 53 17 19 N. 54 25 6 N. 4																								
Last Quarter - 10 7 15 Morning.																									2 13 30 10 9 25 18 21 24 26 2 1																								
New - - - - - 17 4 48 Afternoon.																									3 17 19 11 4 31 19 21 54 27 2 2																								
First Quarter - 25 8 47 Afternoon.																									4 20 8 12 ON. 30 20 21 22 28 7 1																								
																									5 21 41 13 5 25 21 19 54 29 11 4																								
In Perigee - - 6 6 0 Morning.																									6 21 46 14 10 0 22 17 34 30 15 4																								
In Apogee - - 22 2 0 Morning.																									7 20 21 15 14 4 23 14 30 31 19																								
																									8 17 39 16 17 25 24 10 50																								

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 GREENOCK add 19 m. LIVERPOOL add 18 m. PEMBROKE add 20 m.

MAY, 1863.

WESTON-SUPER-MARE.						HOLYHEAD.						KINGSTOWN.						C's AGE AT NOON.
MORNING.				AFTERNOON.		MORNING.				AFTERNOON.		MORNING.				AFTERNOON.		
Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	D.		
4 42 33 5		5 7 34 6		8 21 14 8		8 40 15 1		9 17 10 1		9 38 10 4		9 17 10 1		9 38 10 4		13.4		
5 31 35 6		5 54 36 5		8 58 15 5		9 18 15 9		9 58 10 7		10 17 10 9		9 58 10 7		10 17 10 9		14.4		
6 16 37 0		6 38 37 6		9 37 16 0		9 57 16 3		10 35 10 11		10 54 11 1		10 35 10 11		10 54 11 1		○		
7 0 37 11		7 23 38 3		10 17 16 4		10 37 16 5		11 14 11 2		11 36 11 2		11 14 11 2		11 36 11 2		16.4		
7 45 38 4		8 7 38 2		10 57 16 5		11 18 16 4		11 58 11 2		—		11 58 11 2		—		17.4		
8 29 37 11		8 51 37 6		11 42 16 2		—		0 21 11 1		0 45 10 11		0 21 11 1		0 45 10 11		18.4		
9 14 36 11		9 36 36 1		0 8 15 11		0 35 15 7		1 11 10 10		1 37 10 7		1 11 10 10		1 37 10 7		19.4		
9 58 35 2		10 21 34 2		1 3 15 3		1 31 14 10		2 3 10 4		2 31 10 2		2 3 10 4		2 31 10 2		20.4		
10 46 33 2		11 12 32 2		2 2 14 5		2 34 14 1		3 1 9 11		3 33 9 9		3 1 9 11		3 33 9 9		21.4		
11 43 31 5		—		3 8 13 9		3 46 13 6		4 7 9 7		4 44 9 4		4 7 9 7		4 44 9 4		☾		
0 15 30 10		0 48 30 7		4 25 13 5		5 2 13 5		5 20 9 3		5 52 9 3		5 20 9 3		5 52 9 3		23.4		
1 24 30 8		1 59 30 11		5 36 13 7		6 7 13 9		6 23 9 4		6 54 9 6		6 23 9 4		6 54 9 6		24.4		
2 34 31 4		3 8 31 11		6 38 13 11		7 6 14 1		7 25 9 8		7 55 9 9		7 6 14 1		7 55 9 9		25.4		
3 42 32 6		4 15 33 1		7 33 14 4		7 59 14 7		8 24 9 11		8 53 10 1		7 59 14 7		8 53 10 1		26.4		
4 45 33 8		5 12 34 3		8 22 14 9		8 43 14 11		9 19 10 2		9 43 10 3		8 43 14 11		9 43 10 3		27.4		
5 36 34 7		6 0 35 0		9 4 15 1		9 24 15 2		10 4 10 4		10 23 10 5		9 24 15 2		10 23 10 5		28.4		
6 23 35 2		6 44 35 2		9 43 15 3		10 3 15 3		10 41 10 6		11 0 10 7		10 3 15 3		10 41 10 6		●		
7 4 35 2		7 24 35 2		10 21 15 3		10 38 15 2		11 18 10 7		11 36 10 6		10 38 15 2		11 18 10 7		0.8		
7 43 35 1		7 59 34 9		10 55 15 0		11 11 14 10		11 55 10 5		—		11 11 14 10		11 55 10 5		1.8		
8 15 34 5		8 31 34 2		11 27 14 8		11 45 14 6		0 13 10 3		0 31 10 2		11 45 14 6		0 13 10 3		2.8		
8 48 33 10		9 6 33 5		—		0 5 14 4		0 49 10 1		1 9 9 11		0 5 14 4		0 49 10 1		3.8		
9 22 32 11		9 38 32 4		0 26 14 2		0 46 13 11		1 28 9 9		1 47 9 7		0 46 13 11		1 28 9 9		4.8		
9 54 31 9		10 11 31 2		1 7 13 8		1 28 13 5		2 7 9 6		2 28 9 4		1 28 13 5		2 7 9 6		5.8		
10 30 30 7		10 50 30 0		1 52 13 2		2 16 13 0		2 51 9 3		3 15 9 2		2 16 13 0		2 51 9 3		6.8		
11 11 29 5		11 37 29 1		2 42 12 9		3 10 12 8		3 40 9 0		4 9 8 11		3 10 12 8		3 40 9 0		☽		
—		0 6 28 9		3 41 12 7		4 15 12 6		4 39 8 10		5 10 8 10		4 15 12 6		4 39 8 10		8.8		
0 39 28 9		1 11 29 0		4 52 12 7		5 24 12 10		5 43 8 10		6 13 8 11		5 24 12 10		5 43 8 10		9.8		
1 41 29 5		2 12 29 11		5 52 13 1		6 19 13 4		6 39 9 1		7 6 9 4		6 19 13 4		6 39 9 1		10.8		
2 44 30 8		3 17 31 6		6 47 13 7		7 13 13 11		7 34 9 6		8 2 9 8		7 13 13 11		7 34 9 6		11.8		
3 49 32 4		4 20 33 3		7 38 14 4		8 3 14 8		8 29 9 11		8 57 10 1		8 3 14 8		8 29 9 11		12.8		
4 51 34 5		5 21 35 5		8 27 15 1		8 50 15 5		9 24 10 4		9 50 10 6		8 50 15 5		9 24 10 4		13.8		
Mean Spring } Range. }				18ft. 7in.		8ft. 0in.				5ft. 6in.								

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
3 0		9	3 44		17	3 52		25	3 23	
3 7		10	3 47		18	3 50		26	3 17	
3 14		11	3 50		19	3 48		27	3 11	
3 21		12	3 52		20	3 45		28	3 4	
3 27		13	3 53		21	3 41		29	2 57	
3 32		14	3 53		22	3 38		30	2 49	
3 37		15	3 53		23	3 33		31	2 41	
3 41		16	3 53		24	3 28				

as of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

MAY, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
F.	1	10 27	9 55	8 11	9 14	9 1	6 5	7 0	6 24	7 3	3 24	10 0	3 42	
S.	2	11 19	9 33	9 3	9 53	9 5	6 44	7 5	7 6	7 7	4 0	10 8	4 20	
Mo.	3	morn.	10 13	9 6	10 33	9 7	7 27	7 9	7 47	7 10	4 40	11 2	5 1	
M.	4	0 16	10 53	9 7	11 14	9 7	8 7	7 11	8 28	8 0	5 22	11 6	5 44	
Tu.	5	1 15	11 35	9 7	11 56	9 6	8 48	7 11	9 8	7 10	6 5	11 6	6 26	
W.	6	2 17	—	—	0 21	9 6	9 30	7 8	9 52	7 6	6 50	11 2	7 15	
Th.	7	3 18	0 47	9 5	1 13	9 4	10 16	7 3	10 42	7 1	7 40	10 7	8 5	
F.	8	4 18	1 42	9 2	2 12	9 0	11 10	6 10	11 47	6 6	8 32	9 11	9 3	
S.	9	5 14	2 44	8 10	3 16	8 8	—	—	0 28	6 3	9 39	9 4	10 16	
Mo.	10	6 7	3 50	8 7	4 25	8 6	1 10	6 1	1 55	5 11	10 55	9 0	11 33	
M.	11	6 57	5 1	8 5	5 34	8 4	2 37	6 0	3 11	6 2	—	—	0 7	
Tu.	12	7 45	6 6	8 4	6 39	8 4	3 42	6 5	4 10	6 7	0 40	9 0	1 12	
W.	13	8 33	7 12	8 5	7 40	8 6	4 35	6 8	4 58	6 10	1 44	9 3	2 13	
Th.	14	9 20	8 6	8 8	8 32	8 10	5 20	6 11	5 43	7 0	2 38	9 8	3 3	
F.	15	10 7	8 56	8 11	9 18	9 0	6 6	7 1	6 29	7 2	3 25	10 1	3 46	
S.	16	10 56	9 40	9 1	10 0	9 2	6 51	7 3	7 12	7 3	4 6	10 5	4 26	
Mo.	17	11 45	10 19	9 2	10 38	9 3	7 33	7 3	7 53	7 3	4 46	10 8	5 7	
M.	18	0 35	10 57	9 2	11 15	9 2	8 11	7 4	8 28	7 3	5 27	10 8	5 45	
Tu.	19	1 25	11 33	9 1	11 49	9 0	8 44	7 2	9 0	7 1	6 3	10 6	6 18	
W.	20	2 14	—	—	0 6	9 0	9 16	6 11	9 32	6 9	6 36	10 2	6 54	
Th.	21	3 2	0 25	8 11	0 45	8 10	9 49	6 7	10 7	6 6	7 13	9 9	7 31	
F.	22	3 48	1 4	8 9	1 25	8 8	10 26	6 4	10 45	6 2	7 49	9 3	8 8	
S.	23	4 33	1 47	8 7	2 10	8 6	11 9	6 0	11 37	5 10	8 29	8 10	8 53	
Mo.	24	5 16	2 34	8 5	2 59	8 4	—	—	0 8	5 8	9 21	8 6	9 49	
M.	25	6 0	3 24	8 3	3 51	8 2	0 40	5 6	1 13	5 6	10 19	8 4	10 50	
Tu.	26	6 43	4 20	8 1	4 51	8 1	1 49	5 6	2 27	5 7	11 23	8 3	11 58	
W.	27	7 28	5 25	8 1	5 55	8 1	3 2	5 8	3 32	5 11	—	—	0 28	
Th.	28	8 14	6 22	8 2	6 51	8 3	3 56	6 2	4 20	6 4	0 56	8 8	1 24	
F.	29	9 5	7 20	8 4	7 47	8 5	4 43	6 6	5 4	6 9	1 52	9 1	2 15	
S.	30	9 59	8 12	8 8	8 36	8 10	5 25	6 11	5 47	7 1	2 44	9 8	3 7	
Mo.	31	10 57	9 0	9 1	9 25	9 3	6 10	7 3	6 37	7 5	3 29	10 4	3 52	
Half Mean Spring Range.			4 ft. 9 in.				3 ft. 10 in.				5 ft. 7 in.			
Phases of the Moon.							Moon's Declination at Noon.							
			D.	H. M.			M.D.	°	'	M.D.	°	'	M.D.	°
Full	- - - -	3	2 52	Afternoon.			1	9	8. 3	9	13	8. 53	17	19 N. 54
Last Quarter	- - - -	10	7 15	Morning.			2	13	30	10	9	25	18	21 24
New	- - - -	17	4 48	Afternoon.			3	17	19	11	4	31	19	21 54
First Quarter	- - - -	25	8 47	Afternoon.			4	20	8	12	0	N. 30	20	21 22
							5	21	41	13	5	25	21	19 54
In Perigee	- -	6	6 0	Morning.			6	21	46	14	10	0	22	17 34
In Apogee	- -	21	2 0	Morning.			7	20	21	15	14	4	23	14 30
							8	17	39	16	17	25	24	10 50

The times for High Water are given for Mean Time at Place; if Dublin or Railway Time be required
 BELFAST subtract 3 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

MAY, 1863.

HOUR OF DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
	Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			D.				
1	2 39 13 1	3 0 13 7	2 56 10 7	3 18 10 11	3 11 11 4	3 36 11 8	13° 4																		
2	3 20 14 0	3 40 14 4	3 40 11 2	4 3 11 6	3 59 11 11	4 23 12 3	14° 4																		
3	4 0 14 8	4 20 14 11	4 23 11 8	4 44 11 11	4 46 12 5	5 7 12 6	○																		
4	4 40 15 2	5 2 15 4	5 6 12 0	5 29 12 1	5 28 12 7	5 50 12 9	16° 4																		
5	5 25 15 4	5 48 15 2	5 52 12 1	6 15 12 0	6 13 12 9	6 36 12 9	17° 4																		
6	6 12 15 0	6 36 14 9	6 38 11 11	7 2 11 9	6 59 12 8	7 23 12 7	18° 4																		
7	7 2 14 5	7 28 14 0	7 26 11 6	7 50 11 3	7 47 12 5	8 10 12 2	19° 4																		
8	7 56 13 7	8 26 13 0	8 15 11 0	8 41 10 8	8 34 11 11	8 59 11 8	20° 4																		
9	8 57 12 6	9 29 12 1	9 9 10 4	9 37 10 1	9 24 11 5	9 53 11 1	21° 4																		
10	10 4 11 10	10 41 11 9	10 7 9 11	10 40 9 9	10 27 10 10	11 1 10 7	⊕																		
11	11 17 11 9	11 52 11 10	11 14 9 8	11 49 9 9	11 33 10 6	— —	23° 4																		
12	— —	0 24 12 0	— —	0 23 9 10	0 4 10 5	0 35 10 7	24° 4																		
1	0 55 12 3	1 23 12 6	0 58 9 11	1 32 10 1	1 7 10 8	1 40 10 10	25° 4																		
2	1 49 12 9	2 16 13 0	2 3 10 4	2 32 10 6	2 13 11 1	2 45 11 3	26° 4																		
3	2 41 13 3	3 5 13 5	2 59 10 8	3 23 10 10	3 14 11 5	3 41 11 7	27° 4																		
4	3 26 13 7	3 46 13 9	3 46 10 11	4 8 11 1	4 6 11 8	4 30 11 9	28° 4																		
5	4 6 13 10	4 26 13 11	4 29 11 2	4 50 11 2	4 52 11 10	5 13 11 10	●																		
6	4 45 13 11	5 4 13 11	5 10 11 2	5 30 11 2	5 32 11 9	5 50 11 9	0° 8																		
7	5 23 13 10	5 40 13 8	5 50 11 1	6 7 11 0	6 9 11 9	6 27 11 8	1° 8																		
8	5 57 13 5	6 15 13 3	6 24 10 10	6 41 10 9	6 44 11 7	7 2 11 6	2° 8																		
9	6 34 13 0	6 53 12 9	7 0 10 7	7 18 10 5	7 21 11 5	7 38 11 4	3° 8																		
10	7 12 12 6	7 32 12 3	7 36 10 3	7 53 10 1	7 55 11 2	8 12 11 1	4° 8																		
11	7 53 12 0	8 16 11 8	8 11 9 11	8 31 9 9	8 30 10 11	8 49 10 9	5° 8																		
12	8 40 11 4	9 5 11 1	8 53 9 7	9 15 9 5	9 8 10 7	9 29 10 5	6° 8																		
1	9 30 10 11	9 59 10 9	9 37 9 3	10 1 9 2	9 53 10 3	10 22 10 1	7° 8																		
2	10 31 10 9	11 7 10 10	10 30 9 1	11 5 9 1	10 52 10 0	11 25 9 11	8° 8																		
3	11 40 11 0	— —	11 37 9 2	— —	11 54 9 11	— —	9° 8																		
4	0 8 11 3	0 36 11 7	0 6 9 4	0 37 9 6	0 20 10 1	0 47 10 3	10° 8																		
5	1 4 11 11	1 30 12 4	1 8 9 9	1 39 10 0	1 17 10 6	1 48 10 9	11° 8																		
6	1 55 12 9	2 21 13 2	2 8 10 3	2 36 10 7	2 19 11 1	2 50 11 4	12° 8																		
7	2 46 13 7	3 11 13 11	3 4 10 11	3 31 11 2	3 20 11 8	3 50 11 11	13° 8																		
If Mean Spring } 7ft. 5in. Range.								5ft. 10in.								6ft. 2in.									

Equation of Time at Noon.

M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
3	0		9	3	44		17	3	52		25	3	23	
3	7		10	3	47		18	3	50		26	3	17	
3	14		11	3	50		19	3	48		27	3	11	
3	21		12	3	52		20	3	45		28	3	4	
3	27		13	3	53		21	3	41		29	2	57	
3	32		14	3	53		22	3	38		30	2	49	
3	37		15	3	53		23	3	33		31	2	41	
3	41		16	3	53		24	3	28					

nes of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 8 m.

JUNE, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRAMIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	12 59	2 45	18	3 9	19	2 4 38	15	5 3	15	6 10 41	12	6 11 6	1
Tu.	2	morn.	3 33	19	3 58	19	5 27	15	5 51	15	11 29	12	10 11 54	1
W.	3	1 2	4 23	19	4 46	19	6 16	15	6 43	16	—	—	0 20	1
Th.	4	2 5	5 10	19	5 35	19	7 6	15	7 27	16	0 45	12	1 10	1
F.	5	3 5	6 1	19	6 26	18	7 50	15	8 15	15	1 37	12	2 11	1
S.	6	4 1	6 52	18	7 18	17	8 41	14	9 6	15	2 27	12	2 53	1
S.	7	4 53	7 47	17	8 14	16	9 29	14	9 54	14	3 19	12	3 46	1
M.	8	5 43	8 42	15	9 10	15	10 18	13	10 47	13	4 11	11	4 39	1
Tu.	9	6 31	9 40	15	10 13	15	11 15	12	11 46	13	5 6	11	5 34	1
W.	10	7 18	10 47	14	11 20	14	—	—	0 21	12	6 5	10	6 36	1
Th.	11	8 5	11 54	14	—	—	0 57	13	1 33	12	7 8	10	7 41	1
F.	12	8 53	0 26	15	0 56	15	2 6	13	2 38	13	8 15	10	8 47	1
S.	13	9 41	1 26	15	1 50	15	3 8	13	3 36	13	9 18	11	9 44	1
S.	14	10 31	2 13	16	2 35	16	4 1	13	4 24	14	10 8	11	10 31	1
M.	15	11 20	2 57	16	3 18	17	4 48	14	5 9	14	10 53	11	11 14	1
Tu.	16	0 29	3 37	17	3 55	17	5 30	14	5 49	14	11 33	11	11 51	1
W.	17	0 58	4 14	17	4 32	17	6 6	14	6 24	14	—	—	0 11	1
Th.	18	1 45	4 49	17	5 6	17	6 41	14	6 56	14	0 29	11	0 48	1
F.	19	2 30	5 23	17	5 40	16	7 12	14	7 28	14	1 6	11	1 23	1
S.	20	3 14	5 57	16	6 14	16	7 43	13	8 0	14	1 41	11	1 57	1
S.	21	3 56	6 32	16	6 51	16	8 16	13	8 31	13	2 15	11	2 34	1
M.	22	4 39	7 11	15	7 32	15	8 47	12	9 4	13	2 52	11	3 12	1
Tu.	23	5 22	7 53	15	8 17	14	9 25	12	9 45	12	3 32	11	3 51	1
W.	24	6 7	8 41	14	9 8	14	10 9	12	10 35	12	4 14	10	4 38	1
Th.	25	6 54	9 36	14	10 9	14	11 2	12	11 35	12	5 4	10	5 30	1
F.	26	7 44	10 44	14	11 19	14	—	—	0 12	12	6 1	10	6 33	1
S.	27	8 39	11 54	15	—	—	0 51	12	1 29	12	7 8	10	7 41	1
S.	28	9 39	0 27	15	0 59	16	2 6	13	2 41	13	8 16	11	8 50	1
M.	29	10 41	1 31	16	1 59	17	3 15	13	3 46	14	9 23	11	9 54	1
Tu.	30	11 45	2 27	18	2 53	18	4 17	14	4 45	15	10 22	12	10 49	1
Half Mean Spring Range.			9ft. 6in.				7ft. 9in.				6ft. 4in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°
Full	—	—	1	11	30	Afternoon.	1	21	8.13	9	4	N.20	17	20N.25
Last Quarter	—	—	8	1	52	Afternoon.	2	21	54	10	9	1	18	18 18
New	—	—	16	7	36	Morning.	3	21	1	11	13	11	19	15 27
First Quarter	—	—	24	10	31	Morning.	4	18	40	12	16	40	20	11 57
							5	15	6	13	19	21	21	7 58
In Perigee	—	—	3	7	0	Morning.	6	10	40	14	21	7	22	3 37
In Apogee	—	—	18	2	0	Afternoon.	7	5	45	15	21	52	23	0 8.56
							8	0	39	16	21	38	24	5 33

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 Brest add 16 m. | Devonport add 17 m. | Portsmouth add 4 m.

JUNE, 1863.

DOVER.										SHEERNESS.										LONDON.										C's AGE AT NOON.
MORNING.					AFTERNOON.					MORNING.					AFTERNOON.					MORNING.					AFTERNOON.					
Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	D.										
1 10 8 18 3		10 34 18 8		11 53 15 9		—		0 58 18 0		1 23 18 4		0		1 23 18 4		2 10 19 0		15.8												
2 11 0 18 11		11 27 19 1		0 18 16 0		0 43 16 2		1 47 18 8		2 10 19 0		2 58 19 5		16.8		3 47 19 7		17.8												
3 11 53 19 1		—		1 7 16 4		1 30 16 5		2 35 19 3		2 58 19 5		3 47 19 7		17.8		4 35 19 5		18.8												
4 0 19 19 2		0 45 19 2		1 55 16 5		2 18 16 5		3 24 19 6		3 47 19 7		4 35 19 5		18.8		5 25 19 0		19.8												
5 1 13 19 1		1 41 18 11		2 41 16 4		3 5 16 3		4 11 19 6		4 35 19 5		5 25 19 0		19.8		6 18 18 5		20.8												
6 2 7 18 8		2 34 18 3		3 30 16 0		3 56 15 9		5 0 19 3		5 25 19 0		6 18 18 5		20.8		7 15 17 8		21.8												
7 3 0 17 10		3 27 17 5		4 22 15 6		4 49 15 2		5 51 18 9		6 18 18 5		7 15 17 8		21.8		8 15 17 1		22.8												
8 3 53 16 11		4 20 16 5		5 17 14 10		5 45 14 6		6 46 18 0		7 15 17 8		8 15 17 1		22.8		9 24 16 9		23.8												
9 4 45 16 1		5 10 15 8		6 17 14 3		6 48 14 0		7 44 17 4		8 15 17 1		9 24 16 9		23.8		10 25 16 7		24.8												
0 5 36 15 5		6 5 15 3		7 20 13 10		7 54 13 9		8 49 16 11		9 24 16 9		10 25 16 7		24.8		11 30 16 8		25.8												
1 6 34 15 4		7 7 15 6		8 27 13 9		8 59 13 11		9 54 16 7		10 25 16 7		11 30 16 8		25.8		—		26.8												
2 7 41 15 8		8 12 15 10		9 32 14 0		10 2 14 2		10 58 16 7		11 30 16 8		—		26.8		0 29 16 11		27.8												
3 8 41 16 1		9 7 16 3		10 32 14 4		11 0 14 5		12 0 16 9		—		0 53 17 1		27.8		1 39 17 5		28.8												
4 9 31 16 5		9 55 16 8		11 24 14 7		11 46 14 8		0 29 16 11		0 53 17 1		1 39 17 5		28.8		2 18 17 8		29.8												
5 10 19 16 10		10 42 17 0		—		0 8 14 10		1 16 17 3		2 18 17 8		3 34 18 0		3.2		4 41 17 10		4.2												
6 11 3 17 1		11 24 17 1		0 30 14 11		0 51 15 0		2 0 17 7		2 58 17 11		3 34 18 0		3.2		4 41 17 10		4.2												
7 11 44 17 1		—		1 10 15 1		1 28 15 1		2 38 17 10		3 34 18 0		4 41 17 10		4.2		5 16 17 8		5.2												
8 0 3 17 2		0 22 17 2		1 47 15 1		2 3 15 0		3 16 17 11		4 41 17 10		5 16 17 8		5.2		6 13 16 5		9.2												
9 0 41 17 2		1 0 17 1		2 20 15 0		2 37 14 11		3 51 18 0		4 41 17 10		5 16 17 8		5.2		6 13 16 5		9.2												
10 1 18 17 1		1 37 17 0		2 53 14 11		3 9 14 10		4 24 17 11		5 16 17 8		6 13 16 5		9.2		7 18 16 9		10.2												
11 1 55 16 11		2 14 16 9		3 26 14 8		3 44 14 7		4 58 17 9		5 16 17 8		6 13 16 5		9.2		8 13 16 5		10.2												
12 2 34 16 7		2 53 16 5		4 3 14 5		4 22 14 3		5 34 17 7		6 13 16 5		7 18 16 9		10.2		9 18 16 3		11.2												
13 3 13 16 2		3 33 15 11		4 42 14 1		5 2 13 11		6 13 17 3		7 18 16 9		8 13 16 5		10.2		10 25 16 5		11.2												
14 3 55 15 8		4 18 15 5		5 25 13 10		5 50 13 8		6 55 16 11		8 13 16 5		9 18 16 3		10.2		11 33 16 10		12.2												
15 4 42 15 2		5 6 15 0		6 16 13 6		6 46 13 4		7 44 16 7		9 18 16 3		10 25 16 5		11.2		—		—												
16 5 33 14 11		6 2 14 11		7 16 13 4		7 50 13 5		8 44 16 4		—		—		—		0 2 17 2		13.2												
17 6 34 15 2		7 7 15 7		8 25 13 6		8 59 13 9		9 50 16 3		1 0 18 0		—		—		1 0 18 0		14.2												
18 7 42 16 0		8 15 16 6		9 32 14 1		10 3 14 4		11 0 16 7		—		—		—		—		—												
19 8 46 16 11		9 17 17 5		10 34 14 9		11 5 15 1		—		—		—		—		—		—												
20 9 46 17 11		10 15 18 5		11 32 15 4		11 59 15 9		0 33 17 6		—		—		—		—		—												

If Mean Spring } 9ft. 4in.
Range.

8ft. 0in.

9ft. 7in.

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
2 32		9	1 11		17	0 28		25	2 12	
2 23		10	0 59		18	0 41		26	2 25	
2 14		11	0 47		19	0 54		27	2 37	
2 4		12	0 35		20	1 7		28	2 50	
1 54		13	0 23		21	1 20		29	3 2	
1 44		14	0 10		22	1 33		30	3 14	
1 33		15	0 3	Sub.	23	1 46				
1 22		16	0 15		24	1 59				

Times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 8 m. | LONDON 0 m.

JUNE, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRAMIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTER.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
M.	1	12 59	11 5	11 5	11 31	11 7	5 22	20 3	5 47	20 11	2 18	13 9	2 43	1
Tu.	2	morn.	11 56	11 9	—	—	6 12	20 11	6 37	21 2	3 7	14 3	3 30	1
W.	3	1 2	0 20	11 10	0 43	11 10	7 22	21 4	7 27	21 4	3 53	14 8	4 17	1
Th.	4	2 5	1 8	11 9	1 32	11 8	7 51	21 5	8 14	21 4	4 40	14 10	5 4	1
F.	5	3 5	1 56	11 7	2 22	11 6	8 40	21 2	9 6	20 10	5 30	14 5	5 57	1
S.	6	4 1	2 48	11 5	3 14	11 3	9 32	20 5	9 58	20 0	6 23	13 11	6 51	1
S.	7	4 53	3 40	11 1	4 5	10 10	10 24	19 6	10 53	19 0	7 20	13 3	7 49	1
M.	8	5 43	4 32	10 8	4 59	10 6	11 25	18 7	12 0	18 2	8 18	12 7	8 48	1
Tu.	9	6 31	5 28	10 5	5 56	10 3	—	—	0 33	17 10	9 19	12 1	9 51	1
W.	10	7 18	6 26	10 2	7 1	10 2	1 4	17 6	1 33	17 5	10 24	11 9	10 55	1
Th.	11	8 5	7 36	10 2	8 7	10 3	2 3	17 4	2 31	17 6	11 24	11 9	11 53	1
F.	12	8 53	8 39	10 4	9 9	10 5	3 1	17 8	3 31	17 11	—	—	0 21	1
S.	13	9 41	9 39	10 6	10 9	10 7	4 1	18 2	4 29	18 5	0 51	12 2	1 19	1
S.	14	10 31	10 35	10 8	10 57	10 9	4 53	18 7	5 14	18 9	1 45	12 6	2 9	1
M.	15	11 20	11 20	10 10	11 43	11 0	5 36	18 11	5 59	19 0	2 32	12 9	2 55	1
Tu.	16	0 8 9	—	—	0 4	10 11	6 21	19 1	6 41	19 2	3 15	13 0	3 33	1
W.	17	0 58	0 23	10 11	0 41	10 11	6 59	19 3	7 18	19 2	3 51	13 2	4 9	1
Th.	18	1 45	0 59	10 10	1 17	10 10	7 36	19 2	7 54	19 2	4 26	13 3	4 43	1
F.	19	2 30	1 35	10 9	1 53	10 8	8 11	19 2	8 27	19 1	5 0	13 1	5 17	1
S.	20	3 14	2 9	10 8	2 26	10 7	8 44	19 0	9 2	18 9	5 34	12 11	5 52	1
S.	21	3 56	2 44	10 6	3 2	10 5	9 20	18 7	9 39	18 4	6 11	12 7	6 31	1
M.	22	4 39	3 21	10 4	3 39	10 3	9 57	18 2	10 17	17 11	6 52	12 3	7 13	1
Tu.	23	5 22	3 58	10 3	4 18	10 2	10 38	17 8	11 2	17 6	7 34	12 0	7 57	1
W.	24	6 7	4 38	10 1	5 2	10 0	11 30	17 3	11 59	17 0	8 22	11 8	8 48	1
Th.	25	6 54	5 27	9 11	5 54	9 11	—	—	0 30	16 10	9 17	11 5	9 47	1
F.	26	7 44	6 22	9 11	6 57	9 11	1 0	16 9	1 30	16 9	10 20	11 4	10 52	1
S.	27	8 39	7 33	10 0	8 7	10 2	2 0	16 11	2 31	17 3	11 24	11 7	11 53	1
S.	28	9 39	8 39	10 4	9 11	10 6	3 1	17 9	3 32	18 3	—	—	0 22	1
M.	29	10 41	9 42	10 9	10 14	11 0	4 3	18 10	4 34	19 4	0 53	12 8	1 24	1
Tu.	30	11 45	10 43	11 3	11 11	11 5	5 1	19 10	5 28	20 4	1 54	13 5	2 23	1

Half Mean Spring }
Range.

5ft. 9in.

10ft. 5in.

7ft. 2in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°
Full	-	-	1 11 30	Afternoon.	1	218.13	9	4 N.20	17	20 N.25	25	10		
Last Quarter	-	8	1 52	Afternoon.	2	21 54	10	9 1	18	18 18	26	14		
New	-	-	16 7 36	Morning.	3	21 1	11	13 11	19	15 27	27	17		
First Quarter	-	24	10 31	Morning.	4	18 40	12	16 40	20	11 57	28	20		
					5	15 6	13	19 21	21	7 58	29	21		
In Perigee	-	3	7 0	Morning.	6	10 40	14	21 7	22	3 37	30	21		
In Apogee	-	18	2 0	Afternoon.	7	5 45	15	21 52	23	08.56				
					8	0 39	16	21 38	24	5 33				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be require
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

JUNE, 1863.

NORTH SHIELDS.						LEITH.						THURSO.						C's AG AT NOON
MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			
Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. I. F.		
2 21	12	7	2 44	12	11	1 16	15	7	1 41	16	0	7 32	13	0	7 54	13	4	○
3 7	13	2	3 29	13	5	2 5	16	4	2 28	16	7	8 16	13	7	8 39	13	8	15.8
3 54	13	7	4 18	13	7	2 51	16	8	3 14	16	8	9 3	13	8	9 27	13	7	16.8
4 42	13	6	5 7	13	4	3 38	16	7	4 3	16	5	9 52	13	5	10 19	13	3	17.8
5 34	13	2	6 1	13	0	4 29	16	3	4 55	16	1	10 46	13	0	11 13	12	8	18.8
6 27	12	10	6 54	12	7	5 21	15	10	5 49	15	6	11 41	12	4	—	—	—	19.8
7 21	12	3	7 52	11	10	6 18	15	1	6 47	14	8	0 10	11	11	0 40	11	6	20.8
8 23	11	5	8 56	11	1	7 17	14	4	7 50	14	0	1 9	11	3	1 41	10	11	☾
9 29	10	11	10 3	10	9	8 23	13	9	8 55	13	6	2 14	10	8	2 47	10	6	22.8
10 36	10	9	11 7	10	9	9 29	13	5	10 1	13	5	3 24	10	4	4 0	10	3	23.8
11 36	10	10	—	—	—	10 29	13	5	10 59	13	6	4 31	10	2	5 2	10	2	24.8
0 6	10	10	0 35	10	11	11 28	13	7	11 57	13	9	5 30	10	3	5 59	10	5	25.8
1 3	11	0	1 29	11	2	—	—	—	0 23	13	11	6 24	10	8	6 45	10	11	26.8
1 52	11	3	2 13	11	6	0 46	14	1	1 8	14	4	7 5	11	2	7 24	11	6	27.8
2 35	11	8	2 56	11	10	1 31	14	7	1 53	14	9	7 43	11	9	8 2	11	11	28.8
3 15	11	11	3 33	12	0	2 13	14	11	2 32	15	0	8 20	12	0	8 37	12	0	●
3 51	12	1	4 10	12	0	2 49	15	1	3 7	15	0	8 55	11	11	9 12	11	11	1.2
4 27	12	0	4 45	11	11	3 23	14	11	3 41	14	10	9 30	11	10	9 47	11	9	2.2
5 3	11	10	5 21	11	9	3 58	14	9	4 15	14	8	10 5	11	8	10 23	11	6	3.2
5 38	11	8	5 57	11	7	4 33	14	7	4 51	14	6	10 42	11	4	11 0	11	2	4.2
6 15	11	6	6 34	11	4	5 9	14	4	5 29	14	3	11 21	11	0	11 42	10	10	5.2
6 54	11	3	7 14	11	1	5 50	14	1	6 11	13	11	—	—	—	0 3	10	8	6.2
7 36	10	11	8 1	10	8	6 33	13	8	6 56	13	6	0 24	10	6	0 48	10	4	7.2
8 28	10	5	8 55	10	4	7 22	13	3	7 50	13	1	1 14	10	2	1 40	10	0	☽
9 27	10	3	9 59	10	3	8 20	13	0	8 51	12	11	2 11	9	11	2 43	9	10	9.2
10 32	10	3	11 4	10	5	9 26	12	11	9 59	13	1	3 20	9	10	3 57	9	11	10.2
11 37	10	8	—	—	—	10 30	13	3	11 0	13	6	4 30	10	0	5 2	10	3	11.2
0 7	10	11	0 36	11	2	11 29	13	10	11 59	14	2	5 31	10	6	6 1	10	11	12.2
1 5	11	6	1 33	11	10	—	—	—	0 27	14	8	6 28	11	5	6 53	12	0	13.2
2 0	12	2	2 26	12	8	0 54	15	2	1 22	15	8	7 16	12	6	7 39	13	1	14.2
Mean Spring } Range.			6ft. 8in.			8ft. 2in.			6ft. 7in.									

Equation of Time at Noon.

M.	S.	Add.	M. D.	M.	S.	Add.	M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.
2	32		9	1	11		17	0	28		25	2	12	
2	23		10	0	59		18	0	41		26	2	25	
2	14		11	0	47		19	0	54		27	2	37	
2	4		12	0	35		20	1	7		28	2	50	
1	54		13	0	23		21	1	20		29	3	2	
1	44		14	0	10		22	1	33		30	3	14	
1	33		15	0	3	Sub.	23	1	46					
1	22		16	0	15		24	1	59					

Times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

JUNE, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.
M.	1	11 59	11 4	9 5	11 31	9 7	10 19	25 6	10 44	25 10	5 8	20 5	5 35	—
Tu.	2	morn.	11 57	9 9	—	—	11 8	26 3	11 33	26 6	6 0	21 3	6 25	—
W.	3	1 2	0 22	9 10	0 47	9 11	11 59	26 7	—	—	6 50	21 7	7 13	—
Th.	4	2 5	1 12	9 11	1 37	9 11	0 23	26 8	0 47	26 7	7 37	21 6	8 2	—
F.	5	3 5	2 2	9 11	2 27	9 10	1 12	26 4	1 37	25 11	8 28	21 0	8 54	—
S.	6	4 1	2 52	9 9	3 17	9 8	2 22	25 5	2 28	24 11	9 19	20 2	9 43	—
☾	7	4 53	3 42	9 6	4 8	9 4	2 53	24 4	3 20	23 11	10 8	19 1	10 33	—
M.	8	5 43	4 35	9 1	5 3	9 1	3 47	23 1	4 17	22 6	10 58	18 0	11 21	—
Tu.	9	6 31	5 31	8 11	6 0	8 9	4 47	22 0	5 19	21 8	11 45	17 0	—	—
W.	10	7 18	6 31	8 11	7 2	8 7	5 55	21 6	6 31	21 5	0 12	16 9	0 43	—
Th.	11	8 5	7 33	8 6	8 5	8 7	7 3	21 6	7 35	21 8	1 18	16 7	1 55	—
F.	12	8 53	8 38	8 8	9 9	8 9	8 6	21 11	8 35	22 2	2 30	16 11	3 4	—
S.	13	9 41	9 39	8 9	10 5	8 10	9 2	22 6	9 26	22 9	3 35	17 6	4 3	—
☾	14	10 31	10 29	8 11	10 52	8 11	9 48	23 0	10 9	23 3	4 30	18 1	4 55	—
M.	15	11 20	11 16	11 11	11 39	9 0	10 31	23 5	10 53	23 7	5 20	18 8	5 44	—
Tu.	16	0 8 9	12 0	9 1	—	—	11 12	23 8	11 31	23 10	6 4	18 11	6 22	—
W.	17	0 58	0 19	9 1	0 38	9 1	11 50	23 9	—	—	6 40	19 1	6 58	—
Th.	18	1 45	0 56	9 2	1 15	9 2	0 8	23 10	0 25	23 10	7 15	19 1	7 32	—
F.	19	2 30	1 32	9 2	1 49	9 2	0 43	23 10	1 0	23 9	7 49	18 11	8 6	—
S.	20	3 14	2 6	9 2	2 23	9 1	1 16	23 7	1 33	23 3	8 24	18 8	8 42	—
☾	21	3 56	2 40	11	2 59	9 0	1 51	23 1	2 9	23 9	9 0	18 3	9 18	—
M.	22	4 39	3 16	9 0	3 35	8 11	2 27	22 6	2 45	22 4	9 36	17 10	9 55	—
Tu.	23	5 22	3 55	8 11	4 15	8 10	3 5	22 0	3 26	21 8	10 13	17 4	10 34	—
W.	24	6 7	4 38	11	5 2	8 8	3 50	21 4	4 16	21 1	10 56	16 8	11 18	—
Th.	25	6 54	5 29	8 7	5 56	8 6	4 45	20 9	5 15	20 8	11 42	16 2	—	—
F.	26	7 44	6 27	8 5	6 59	8 5	5 50	20 9	6 27	20 11	0 10	16 2	0 40	—
S.	27	8 39	7 32	8 6	8 6	8 7	7 3	21 3	7 35	21 9	1 17	16 4	1 55	—
☾	28	9 39	8 39	8 9	9 12	8 11	8 7	22 4	8 37	23 0	2 31	17 3	3 7	—
M.	29	10 41	9 44	9 1	10 14	9 3	9 7	23 8	9 34	24 5	3 41	18 7	4 14	—
Tu.	30	11 45	10 43	9 5	11 12	9 6	10 1	25 1	10 28	25 7	4 46	20 0	5 16	—

Half Mean Spring } 4^{ft.} 10^{in.}
Range.13^{ft.} 0^{in.}10^{ft.} 6^{in.}

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
Full - - - - -	1	11	30	Afternoon.	1	218.	13	9	4	N. 20	17	20	N. 25	25	1				
Last Quarter -	8	1	52	Afternoon.	2	21	54	10	9	1	18	18	18	26	1				
New - - - - -	16	7	36	Morning.	3	21	1	11	13	11	19	15	27	27	1				
First Quarter	24	10	31	Morning.	4	18	40	12	16	40	20	11	57	28	2				
					5	15	6	13	19	21	21	7	58	29	2				
					6	10	40	14	21	7	22	3	37	30	2				
In Perigee - -	3	7	0	Morning.	7	5	45	15	21	52	23	0	8. 56						
In Apogee - -	18	2	0	Afternoon.	8	0	39	16	21	38	24	5	33						

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required

GREENOCK add 19 m.

LIVERPOOL add 12 m.

PEMBROKE add 20 m.

JUNE, 1863.

TIDE GAUGE NO.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C'S AGE AT NOON.
	MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	
1	5 49	36 3	6 16	36 11	9 14	15 10	9 38	16 0	10 13	10 9	10 36	10 11	○
2	6 42	37 6	7 8	37 11	10 1	16 2	10 24	16 4	10 58	11 1	11 22	11 2	15.8
3	7 33	38 2	7 57	38 3	10 46	16 5	11 8	16 4	11 46	11 2	—	—	16.8
4	8 20	38 2	8 44	38 0	11 32	16 3	11 59	16 2	0 11	11 1	0 36	11 0	17.8
5	9 8	37 8	9 31	37 1	—	—	0 27	15 11	1 3	10 11	1 30	10 9	18.8
6	9 54	36 4	10 16	35 5	0 55	15 8	1 23	15 4	1 56	10 7	2 23	10 5	19.8
7	10 38	34 6	10 59	33 7	1 51	14 11	2 20	14 7	2 51	10 3	3 19	10 0	20.8
8	11 24	32 7	11 51	31 10	2 50	14 3	3 22	14 0	3 48	9 10	4 20	9 8	☾
9	—	—	0 20	31 2	3 55	13 9	4 28	13 7	4 53	9 6	5 24	9 4	22.8
0	0 50	30 8	1 22	30 5	5 3	13 6	5 34	13 5	5 54	9 3	6 23	9 4	23.8
1	1 54	30 5	2 28	30 6	6 4	13 6	6 34	13 7	6 51	9 5	7 21	9 5	24.8
2	3 3	30 8	3 38	31 0	7 3	13 8	7 31	13 9	7 51	9 6	8 21	9 7	25.8
3	4 13	31 5	4 43	31 11	7 58	13 11	8 22	14 1	8 51	9 8	9 18	9 9	26.8
4	5 11	32 6	5 36	32 11	8 43	14 3	9 4	14 4	9 42	9 10	10 4	10 0	27.8
5	6 1	33 4	6 25	33 7	9 25	14 6	9 46	14 7	10 24	10 2	10 44	10 2	28.8
6	6 46	33 9	7 6	33 11	10 5	14 8	10 22	14 8	11 2	10 3	11 20	10 3	●
7	7 25	34 1	7 42	34 2	10 39	14 8	10 55	14 8	11 38	10 3	11 55	10 3	1.2
8	7 59	34 2	8 16	34 2	11 11	14 8	11 27	14 7	—	—	0 13	10 2	2.2
9	8 32	34 1	8 48	34 0	11 45	14 6	—	—	0 31	10 2	0 49	10 1	3.2
0	9 4	33 10	9 20	33 8	0 4	14 5	0 23	14 4	1 7	10 0	1 26	9 11	4.2
1	9 36	33 3	9 53	32 11	0 43	14 2	1 3	14 0	1 44	9 10	2 3	9 8	5.2
2	10 9	32 6	10 25	32 0	1 24	13 10	1 44	13 9	2 23	9 7	2 44	9 6	6.2
3	10 42	31 7	11 2	31 0	2 6	13 7	2 29	13 5	3 5	9 5	3 28	9 4	7.2
4	11 23	30 6	11 49	30 1	2 55	13 3	3 21	13 1	3 53	9 3	4 20	9 2	☽
5	—	—	0 16	29 9	3 52	13 0	4 24	12 11	4 51	9 1	5 21	9 0	9.2
6	0 46	29 8	1 19	29 9	4 59	13 0	5 32	13 2	5 50	9 0	6 20	9 1	10.2
7	1 53	30 1	2 28	30 8	6 4	13 4	6 34	13 7	6 51	9 3	7 21	9 6	11.2
8	3 4	31 4	3 42	32 3	7 3	13 11	7 33	14 3	7 52	9 8	8 24	9 10	12.2
9	4 19	33 2	4 55	34 5	8 3	14 8	8 30	15 1	8 57	10 1	9 28	10 4	13.2
0	5 27	35 6	5 57	36 6	8 56	15 5	9 22	15 10	9 56	10 7	10 21	10 9	14.2
Mean Spring } Range.				18ft. 7in.	8ft. 0in.				5ft. 6in.				

Equation of Time at Noon.

M. S.		M.D.	M. S.		M.D.	M. S.		M.D.	M. S.	
2 32	Add.	9	1 11	Add.	17	0 28	Sub.	25	2 12	Sub.
2 23		10	0 59		18	0 41		26	2 25	
2 14		11	0 47		19	0 54		27	2 37	
2 4		12	0 35		20	1 7		28	2 50	
1 54		13	0 23		21	1 20		29	3 2	
1 44		14	0 10		22	1 33		30	3 14	
1 33		15	0 3	Sub.	23	1 46				
1 22		16	0 15		24	1 59				

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

TIDE TABLES FOR THE

JUNE, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTER	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	11 59	9 50	9 5	10 14	9 6	7 3	7 7	7 28	7 8	4 16	10 11	4 40	
Tu.	2	morn.	10 37	9 7	11 1	9 7	7 51	7 10	8 14	7 11	5 5	11 5	5 30	
W.	3	1 2	11 24	9 7	11 47	9 7	8 37	7 11	8 58	7 10	5 54	11 8	6 17	
Th.	4	2 5	—	—	0 12	9 7	9 21	7 9	9 45	7 7	6 41	11 4	7 7	
F.	5	3 5	0 39	9 6	1 6	9 5	10 9	7 5	10 35	7 3	7 33	10 10	7 58	
S.	6	4 1	1 33	9 4	2 3	9 3	11 1	7 1	11 33	6 10	8 24	10 3	8 52	
S.	7	4 53	2 33	9 1	3 3	8 11	—	—	0 9	6 7	9 24	9 8	9 56	
M.	8	5 43	3 33	8 9	4 4	8 8	0 46	6 4	1 25	6 2	10 31	9 3	11 4	
Tu.	9	6 31	4 34	8 7	5 5	8 6	2 4	6 2	2 40	6 1	11 37	9 0	—	
W.	10	7 18	5 35	8 5	6 5	8 4	3 13	6 2	3 42	6 4	0 8	9 0	0 39	
Th.	11	8 5	6 35	8 3	7 6	8 3	4 7	6 5	4 32	6 6	1 9	8 11	1 40	
F.	12	8 53	7 36	8 4	8 5	8 5	4 56	6 7	5 19	6 7	2 9	9 1	2 37	
S.	13	9 41	8 32	8 6	8 56	8 8	5 43	6 8	6 6	6 9	3 3	9 4	3 25	
S.	14	10 31	9 18	8 9	9 40	8 10	6 28	6 9	6 51	6 10	3 45	9 9	4 6	
M.	15	11 20	10 2	8 11	10 22	9 0	7 14	6 11	7 36	6 11	4 28	10 0	4 49	
Tu.	16	0 29	10 41	9 0	10 59	9 0	7 55	6 11	8 12	7 0	5 9	10 3	5 28	
W.	17	0 58	11 17	9 0	11 33	8 11	8 39	7 0	8 44	7 0	5 47	10 3	6 3	
Th.	18	1 45	11 49	8 11	—	—	9 1	6 11	9 17	6 10	6 19	10 2	6 36	
F.	19	2 30	0 6	8 11	0 25	8 11	9 33	6 9	9 49	6 8	6 54	10 0	7 12	
S.	20	3 14	0 43	8 11	1 2	8 10	10 5	6 7	10 23	6 6	7 29	9 8	7 47	
S.	21	3 56	1 21	8 10	1 42	8 9	10 42	6 5	11 2	6 3	8 5	9 4	8 25	
M.	22	4 39	2 4	8 8	2 26	8 8	11 26	6 2	11 52	6 0	8 45	9 1	9 7	
Tu.	23	5 22	2 48	8 7	3 11	8 6	—	—	0 20	5 10	9 33	8 10	10 1	
W.	24	6 7	3 37	8 5	4 3	8 4	0 52	5 9	1 25	5 9	10 30	8 7	11 2	
Th.	25	6 54	4 32	8 3	5 1	8 3	2 2	5 9	2 36	5 9	11 33	8 7	—	
F.	26	7 44	5 32	8 3	6 2	8 3	3 9	5 11	3 39	6 1	0 5	8 8	0 37	
S.	27	8 39	6 34	8 3	7 7	8 4	4 8	6 4	4 33	6 6	1 9	8 10	1 40	
S.	28	9 39	7 37	8 5	8 7	8 7	4 57	6 8	5 21	6 10	2 10	9 3	2 39	
M.	29	10 41	8 36	8 10	9 4	9 1	5 47	7 0	6 14	7 3	3 7	9 11	3 33	
Tu.	30	11 45	9 31	9 3	9 58	9 5	6 42	7 5	7 10	7 7	3 58	10 8	4 24	

Half Mean Spring }
Range. } 4ft. 9in.

3ft. 10in.

5ft. 7in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Full - - - - -	1	11	30	Afternoon.	1	21 8.13	9	4 N.20	17	20 N.25	25	10			
Last Quarter -	8	1	52	Afternoon.	2	21 54	10	9 1	18	18 18	26	14			
New - - - - -	16	7	36	Morning.	3	21 1	11	13 11	19	15 27	27	17			
First Quarter	24	10	31	Morning.	4	18 40	12	16 40	20	11 57	28	20			
					5	15 6	13	19 21	21	7 58	29	21			
					6	10 40	14	21 7	22	3 37	30	21			
In Perigee - -	3	7	0	Morning.	7	5 45	15	21 52	23	08.56					
In Apogee - -	18	2	0	Afternoon.	8	0 39	16	21 38	24	5 33					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required

BELFAST subtract 2 m.

LONDONDERRY add 4 m.

SLIGO BAY add 9 m.

JUNE, 1863.

GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.																																																																																																																																																																																													
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																																																																																																																																																																																																	
Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.																																																																																																																																																																																																
H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.																																																																																																																																																																																														
3 36 14 3	4 1 14 7	3 58 11 5	4 24 11 8	4 19 12 2	4 47 12 4	○	4 25 14 11	4 48 15 2	4 49 11 10	5 14 12 0	5 11 12 6	5 35 12 7	15.8	5 13 15 3	5 37 15 3	5 40 12 0	6 5 12 1	6 0 12 8	6 24 12 9	6 49 12 9	7 15 12 8	16.8	6 2 15 2	6 28 15 0	6 29 12 0	6 54 11 11	6 49 12 9	7 15 12 8	17.8	6 55 14 9	7 21 14 6	7 20 11 9	7 45 11 6	7 40 12 7	8 4 12 5	18.8	7 48 14 1	8 16 13 8	8 10 11 4	8 34 11 1	8 28 12 3	8 52 12 0	19.8	8 44 13 2	9 13 12 8	8 59 10 9	9 24 10 6	9 15 11 9	9 39 11 6	20.8	9 43 12 4	10 13 12 1	9 50 10 3	10 16 10 0	10 6 11 3	10 36 10 11	☾	10 45 11 10	11 18 11 9	10 44 9 10	11 16 9 9	11 6 10 8	11 35 10 6	22.8	11 50 11 9	—	11 48 9 8	—	—	—	0 4 10 4	23.8	0 20 11 9	0 51 11 10	0 20 9 8	0 52 9 8	0 32 10 5	1 3 10 5	24.8	1 20 12 0	1 48 12 2	1 27 9 9	2 0 9 10	1 35 10 6	2 9 10 8	25.8	2 15 12 3	2 40 12 5	2 31 10 0	2 57 10 1	2 43 10 9	3 12 10 11	26.8	3 4 12 7	3 26 12 9	3 22 10 3	3 46 10 5	3 40 11 0	4 6 11 2	27.8	3 48 12 11	4 9 13 1	4 10 10 6	4 32 10 8	4 31 11 3	4 55 11 4	28.8	4 28 13 3	4 46 13 4	4 52 10 9	5 11 10 10	5 15 11 4	5 33 11 5	●	5 4 13 4	5 22 13 5	5 31 10 10	5 49 10 10	5 51 11 5	6 9 11 6	1.2	5 40 13 4	5 57 13 4	6 7 10 10	6 24 10 10	6 27 11 6	6 45 11 7	2.2	6 15 13 3	6 33 13 2	6 41 10 9	6 58 10 8	7 2 11 6	7 19 11 6	3.2	6 51 13 0	7 9 12 10	7 16 10 7	7 34 10 6	7 36 11 5	7 53 11 5	4.2	7 28 12 9	7 48 12 6	7 52 10 4	8 9 10 3	8 11 11 4	8 28 11 3	5.2	8 9 12 4	8 30 12 1	8 26 10 2	8 45 10 0	8 45 11 2	9 2 11 0	6.2	8 53 11 10	9 17 11 6	9 5 9 10	9 27 9 9	9 20 10 11	9 41 10 9	7.2	9 42 11 4	10 11 11 3	9 49 9 7	10 13 9 6	10 5 10 7	10 33 10 5	8.2	10 41 11 3	11 14 11 3	10 40 9 5	11 12 9 5	11 2 10 3	11 32 10 2	9.2	11 48 11 5	—	11 45 9 5	—	—	—	0 1 10 2	10.2	0 21 11 7	0 52 11 11	0 19 9 7	0 53 9 9	0 32 10 3	1 3 10 6	11.2	1 21 12 3	1 50 12 8	1 28 10 0	2 3 10 3	1 36 10 8	2 13 11 0	12.2	2 20 13 1	2 50 13 6	2 36 10 6	3 8 10 10	2 49 11 4	3 24 11 8	13.2	3 18 14 0	3 44 14 5	3 37 11 2	4 6 11 6	3 56 11 11	4 27 12 3	14.2
Mean Spring Range.				7ft. 5in.				5ft 10in.				6ft. 2in.																																																																																																																																																																																																									

Equation of Time at Noon.

M. S.		M. D.	M. S.		M. D.	M. S.		M. D.	M. S.	
2 32	Add.	9	1 11	Add.	17	0 28	Sub.	25	2 12	Sub.
2 23		10	0 59		18	0 41		26	2 25	
2 14		11	0 47		19	0 54		27	2 37	
2 4		12	0 35		20	1 7		28	2 50	
1 54		13	0 23		21	1 20		29	3 2	
1 44		14	0 10		22	1 33		30	3 14	
1 33		15	0 3	Sub.	23	1 46				
1 22		16	0 15		24	1 59				

Times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

JULY, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	morn.	3 19	19 4	3 45	19 8	5 13	15 3	5 38	16 1	11 15	12 9	11 40	1
Th.	2	0 47	4 12	19 11	4 36	20 1	6 5	15 8	6 32	16 6	—	—	0 7	1
F.	3	1 47	4 59	20 2	5 23	20 1	6 57	15 10	7 18	16 7	0 33	13 2	0 58	1
S.	4	2 43	5 47	19 10	6 12	19 7	7 42	15 9	8 6	16 4	1 22	13 1	1 48	1
M.	5	3 36	6 37	19 2	7 0	18 6	8 29	15 4	8 51	15 8	2 12	13 11	2 37	1
Tu.	6	4 26	7 23	17 11	7 47	17 2	9 12	14 8	9 31	14 10	3 1	12 6	3 24	1
W.	7	5 15	8 11	16 6	8 37	15 9	9 53	13 11	10 16	13 10	3 46	11 11	4 9	1
Th.	8	6 3	9 3	15 2	9 30	14 8	10 38	13 1	11 4	12 11	4 34	11 3	4 59	1
F.	9	6 51	10 3	14 4	10 38	14 1	11 30	12 6	—	—	5 24	10 7	5 56	1
S.	10	7 39	11 15	13 11	11 53	13 11	0 6	12 4	0 42	12 3	6 29	10 2	7 4	1
M.	11	8 28	—	—	0 28	14 0	1 19	12 3	1 55	12 6	7 40	10 2	8 17	1
Tu.	12	9 17	1 1	14 4	1 31	14 8	2 30	12 5	3 1	13 0	8 51	10 5	9 23	1
W.	13	10 6	1 57	15 2	2 21	15 7	3 35	12 11	4 2	13 7	9 51	10 11	10 16	1
Th.	14	10 55	2 43	16 0	3 2	16 5	4 27	13 5	4 50	14 3	10 38	11 3	10 57	1
F.	15	11 42	3 20	16 9	3 39	17 0	5 11	13 9	5 31	14 8	11 16	11 6	11 35	1
S.	16	0 28	3 57	17 3	4 15	17 4	5 49	14 1	6 7	14 11	11 52	11 9	—	—
M.	17	1 12	4 31	17 6	4 46	17 7	6 24	14 3	6 41	15 1	0 11	11 10	0 28	1
Tu.	18	1 55	5 2	17 8	5 18	17 8	6 56	14 4	7 10	15 0	0 45	11 10	1 2	1
W.	19	2 38	5 33	17 8	5 49	17 7	7 24	14 3	7 40	14 9	1 17	11 11	1 33	1
Th.	20	3 20	6 6	17 6	6 24	17 4	7 54	14 0	8 12	14 4	1 51	11 11	2 7	1
F.	21	4 4	6 42	17 0	7 0	16 8	8 28	13 8	8 43	13 11	2 25	11 9	2 43	1
S.	22	4 49	7 21	16 4	7 42	15 10	8 59	13 5	9 16	13 5	3 1	11 7	3 21	1
M.	23	5 37	8 4	15 5	8 28	14 11	9 38	13 0	10 0	12 10	3 41	11 3	4 2	1
Tu.	24	6 28	8 54	14 7	9 24	14 4	10 24	12 8	10 53	12 5	4 25	10 10	4 51	1
W.	25	7 23	10 0	14 3	10 38	14 4	11 24	12 5	—	—	5 19	10 5	5 53	1
Th.	26	8 22	11 19	14 6	12 0	14 11	0 3	12 4	0 44	12 7	6 29	10 5	7 8	1
F.	27	9 24	—	—	0 38	15 6	1 26	12 7	2 8	13 3	7 47	10 8	8 27	1
S.	28	10 27	1 14	16 3	1 46	17 0	2 48	13 4	3 27	14 3	9 5	11 5	9 40	1
M.	29	11 28	2 14	17 11	2 41	18 9	4 2	14 3	4 30	15 4	10 9	12 3	10 37	1
Tu.	30	morn.	3 8	19 6	3 34	20 1	4 59	15 2	5 28	16 2	11 3	12 10	11 30	1
W.	31	0 27	3 58	20 5	4 22	20 7	5 54	15 9	6 19	16 9	11 54	13 4	—	—

Half Mean Spring }
Range.

9ft. 6in.

7ft. 9in.

6ft. 4in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
Full - - - - -	1	6	46	Morning.	1	19	52	9	15	N. 50	17	12	N. 57	25	19				
Last Quarter -	7	10	28	Afternoon.	2	16	43	10	18	43	18	9	5	26	21				
New - - - - -	15	10	54	Afternoon.	3	12	29	11	20	43	19	4	51	27	21				
First Quarter	23	9	32	Afternoon.	4	7	33	12	21	44	20	0	23	28	20				
Full - - - - -	30	1	33	Afternoon.	5	2	20	13	21	45	21	4	S. 11	29	1				
					6	2	N. 52	14	20	48	22	8	39	30	14				
In Perigee - -	1	3	0	Afternoon.	7	7	45	15	18	56	23	12	50	31	9				
In Apogee - -	15	6	0	Afternoon.	8	12	7	16	16	17	24	16	32						
In Perigee - -	30	1	0	Morning.															

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be require

BREST add 18 m.

DEVONPORT add 17 m.

PORTSMOUTH add 4 m

JULY, 1863.

MONTH DAY.	NORTH SHIELDS.						LEITH.						THURSO.						C'S AGE AT NOON.
	MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			
	Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		
1	2 52	13	0	3 17	13	4	1 49	16	1	2 14	16	6	8 3	13	6	8 27	13	9	○
2	3 41	13	7	4 6	13	9	2 39	16	9	3 3	16	11	8 51	13	11	9 15	13	11	16.2
3	4 31	13	10	4 56	13	9	3 27	17	0	3 51	16	11	9 40	13	11	10 5	13	9	17.2
4	5 20	13	8	5 46	13	6	4 15	16	9	4 41	16	7	10 31	13	6	10 57	13	3	18.2
5	6 12	13	3	6 38	13	0	5 6	16	4	5 32	16	1	11 23	12	11	11 49	12	6	19.2
6	7 2	12	9	7 26	12	5	5 57	15	9	6 23	15	4	—	—	—	0 15	12	1	20.2
7	7 52	11	11	8 19	11	6	6 48	14	10	7 14	14	4	0 40	11	8	1 6	11	3	☾
8	8 49	11	0	9 20	10	8	7 44	13	11	8 14	13	6	1 34	10	10	2 4	10	5	22.2
9	9 52	10	5	10 27	10	3	8 44	13	2	9 20	12	11	2 35	10	1	3 13	9	10	23.2
10	11 0	10	2	11 33	10	2	9 55	12	10	10 27	12	9	3 51	9	8	4 26	9	6	24.2
11	—	—	—	0 7	10	3	11 0	12	9	11 32	12	10	5 1	9	6	5 34	9	6	25.2
12	0 39	10	4	1 8	10	5	—	—	—	0 3	13	0	6 4	9	9	6 31	10	0	26.2
1	1 35	10	7	1 59	10	10	0 29	13	3	0 53	13	7	6 53	10	4	7 14	10	9	27.2
2	2 22	11	1	2 43	11	4	1 16	13	11	1 38	14	3	7 32	11	1	7 48	11	5	28.2
3	3 0	11	6	3 17	11	9	1 57	14	6	2 15	14	9	8 4	11	9	8 22	11	11	●
4	3 35	11	11	3 53	12	1	2 34	14	11	2 51	15	1	8 39	12	0	8 55	12	1	0.5
5	4 10	12	2	4 26	12	3	3 7	15	2	3 22	15	2	9 11	12	2	9 27	12	2	1.5
6	4 42	12	3	4 59	12	3	3 38	15	3	3 54	15	2	9 43	12	2	9 59	12	2	2.5
7	5 15	12	2	5 31	12	2	4 9	15	2	4 26	15	1	10 16	12	1	10 34	12	0	3.5
8	5 49	12	1	6 7	12	0	4 44	15	0	5 1	14	11	10 52	11	10	11 10	11	8	4.5
9	6 25	11	11	6 44	11	9	5 19	14	10	5 39	14	8	11 30	11	6	11 51	11	3	5.5
10	7 3	11	7	7 24	11	5	5 59	14	5	6 21	14	2	—	—	—	0 12	11	0	6.5
11	7 47	11	2	8 12	10	10	6 43	13	11	7 7	13	7	0 35	10	9	0 59	10	6	☾
12	8 40	10	6	9 11	10	4	7 35	13	4	8 5	13	1	1 26	10	3	1 56	10	0	8.5
1	9 46	10	2	10 24	10	3	8 38	12	11	9 17	12	11	2 30	9	11	3 9	9	10	9.5
2	11 1	10	4	11 37	10	6	9 55	13	0	10 31	13	2	3 51	9	10	4 30	9	11	10.5
3	—	—	—	0 13	10	10	11 6	13	5	11 40	13	10	5 8	10	1	5 42	10	6	11.5
4	0 47	11	2	1 19	11	7	—	—	—	0 13	14	4	6 15	11	1	6 43	11	8	12.5
5	1 48	12	0	2 15	12	6	0 42	14	10	1 10	15	6	7 6	12	4	7 29	13	0	13.5
6	2 41	13	0	3 5	13	5	1 37	16	1	2 3	16	7	7 53	13	7	8 17	14	0	○
7	3 30	13	10	3 54	14	1	2 29	17	0	2 51	17	3	8 39	14	3	9 2	14	4	15.5
Mean Spring Range. } 6ft. 8in.						8ft. 2in.						6ft. 7in.							

Equation of Time at Noon.

M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
3	25		9	4	49		17	5	48		25	6	13	
3	37		10	4	58		18	5	53		26	6	14	
3	48		11	5	6		19	5	57		27	6	14	
3	59		12	5	14		20	6	1		28	6	13	
4	10		13	5	22		21	6	5		29	6	12	
4	20		14	5	29		22	6	8		30	6	10	
4	30		15	5	36		23	6	10		31	6	7	
4	39	16	5	42	24	6	12							

Times of High Water are given for **Mean Time** at Place; if **Greenwich** or **Railway Time** be required,—for
NORTH SHIELDS add 6 m. **LEITH** add 13 m. **THURSO** add 14 m.

JULY, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	morn.	11 40	9 8	—	—	10 54	26 1	11 30	26 7	5 45	21 1	6 12	2
Th.	2	0 47	0 8	9 10	0 35	10 0	11 46	26 11	—	—	6 38	21 10	7 22	2
F.	3	1 47	1 0	10 1	1 26	10 1	0 11	27 2	0 36	27 3	7 26	22 1	7 50	2
S.	4	2 43	1 50	10 1	2 14	10 1	1 0	27 2	1 24	26 10	8 14	21 9	8 39	2
S.	5	3 36	2 38	10 0	3 2	9 11	1 48	26 5	2 13	25 11	9 4	21 0	9 27	2
M.	6	4 26	3 25	9 9	3 47	9 7	2 36	25 3	2 58	24 7	9 49	19 11	10 9	2
Tu.	7	5 15	4 9	9 5	4 33	9 3	3 21	23 11	3 44	23 2	10 31	18 8	10 53	2
W.	8	6 3	4 58	9 1	5 24	8 10	4 10	22 5	4 39	21 8	11 15	17 2	11 38	2
Th.	9	6 51	5 50	8 1	6 22	8 5	5 8	21 1	5 44	20 8	—	—	0 5	2
F.	10	7 39	6 55	8 3	7 29	8 3	6 22	20 5	6 59	20 5	0 36	15 10	1 12	2
S.	11	8 28	8 5	8 3	8 40	8 4	7 34	20 6	8 9	20 8	1 53	15 8	2 32	2
S.	12	9 17	9 13	8 5	9 44	8 6	8 40	21 0	9 8	21 5	3 7	16 2	3 40	2
M.	13	10 6	10 12	8 7	10 36	8 8	9 33	21 11	9 56	22 4	4 10	17 0	4 36	2
Tu.	14	10 55	10 59	8 9	11 20	8 10	10 17	22 8	10 36	23 0	5 1	17 11	5 24	2
W.	15	11 42	11 41	8 11	—	—	10 55	23 3	11 13	23 6	5 45	18 6	6 5	2
Th.	16	0 23	0 1	9 0	0 20	9 1	11 32	23 10	11 50	24 0	6 24	19 0	6 41	2
F.	17	1 12	0 38	9 1	0 55	9 3	—	—	0 7	24 2	6 58	19 5	7 13	2
S.	18	1 55	1 12	9 3	1 29	9 4	0 23	24 4	0 39	24 5	7 29	19 7	7 44	2
S.	19	2 38	1 44	9 4	1 59	9 5	0 55	24 6	1 11	24 6	8 0	19 7	8 17	2
M.	20	3 20	2 16	9 5	2 33	9 4	1 27	24 4	1 43	24 1	8 34	19 4	8 52	2
Tu.	21	4 4	2 50	9 4	3 7	9 3	2 0	23 10	2 18	23 6	9 10	18 11	9 27	2
W.	22	4 49	3 25	9 2	3 44	9 1	2 36	23 2	2 55	22 10	9 45	18 3	10 4	2
Th.	23	5 37	4 4	9 0	4 26	8 11	3 15	22 5	3 37	21 11	10 24	17 6	10 45	2
F.	24	6 28	4 50	8 9	5 15	8 8	4 21	5	4 30	21 0	11 7	16 8	11 32	2
S.	25	7 23	5 44	8 6	6 19	8 5	5 2	20 8	5 41	20 8	—	—	0 3	2
S.	26	8 22	6 55	1	7 33	8 5	6 22	20 9	7 3	21 1	0 36	16 1	1 17	2
M.	27	9 24	8 12	8 7	8 50	8 9	7 41	21 7	8 18	22 4	2 1	16 8	2 42	2
Tu.	28	10 27	9 27	9 0	10 1	9 2	8 52	23 2	9 22	24 0	3 22	18 1	3 59	2
W.	29	11 28	10 30	9 5	10 59	9 7	9 49	24 11	10 15	25 8	4 31	19 9	5 2	2
Th.	30	morn.	11 28	9 9	11 57	9 11	10 42	26 4	11 9	26 11	5 32	21 3	6 1	2
F.	31	0 27	—	—	0 22	10 1	11 34	27 3	11 58	27 8	6 25	22 3	6 49	2

Half Mean Spring } 4^{ft.} 10^{in.}
Range.13^{ft.} 0^{in.}10^{ft.} 6^{in.}

Phases of the Moon.

	D.	H.	M.	
Full - - - - -	1	6	46	Morning.
Last Quarter -	7	10	28	Afternoon.
New - - - - -	15	10	54	Afternoon.
First Quarter -	23	9	32	Afternoon.
Full - - - - -	30	1	33	Afternoon.
In Perigee - -	1	3	0	Afternoon.
In Apogee - -	15	6	0	Afternoon.
In Perigee - -	30	1	0	Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	19	8.52	9	15	N. 50	17	12	N. 57	25	10	
2	16	43	10	18	43	18	9	5	26	2	
3	12	29	11	20	43	19	4	51	27	2	
4	7	33	12	21	44	20	0	23	28	20	
5	2	20	13	21	45	21	4	S. 11	29	15	
6	2	N. 52	14	20	48	22	8	39	30	1	
7	7	45	15	18	56	23	12	50	31	5	
8	12	7	16	16	17	24	16	32			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 GREENOCK add 10 m. | LIVERPOOL add 12 m. | PEMBROKE add :

JULY, 1863.

MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C's AGE AT NOON.
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
	Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			
1	2 52	13	0		3 17	13	4		1 49	16	1		2 14	16	6	8 3	13	6	8 27	13	9			○	
2	3 41	13	7		4 6	13	9		2 39	16	9		3 3	16	11	8 51	13	11	9 15	13	11			16.2	
3	4 31	13	10		4 56	13	9		3 27	17	0		3 51	16	11	9 40	13	11	10 5	13	9			17.2	
4	5 20	13	8		5 46	13	6		4 15	16	9		4 41	16	7	10 31	13	6	10 57	13	3			18.2	
5	6 12	13	3		6 38	13	0		5 6	16	4		5 32	16	1	11 23	12	11	11 49	12	6			19.2	
6	7 2	12	9		7 26	12	5		5 57	15	9		6 23	15	4	—	—		0 15	12				20.2	
7	7 52	11	11		8 19	11	6		6 48	14	10		7 14	14	4	0 40	11	8	1 6	11	3			☾	
8	8 49	11	0		9 20	10	8		7 44	13	11		8 14	13	6	1 34	10	10	2 4	10	5			22.2	
9	9 52	10	5		10 27	10	3		8 44	13	2		9 20	12	11	2 35	10	1	3 13	9	10			23.2	
10	11 0	10	2		11 33	10	2		9 55	12	10		10 27	12	9	3 51	9	8	4 26	9	6			24.2	
1	—	—			0 7	10	3		11 0	12	9		11 32	12	10	5 1	9	6	5 34	9	6			25.2	
2	0 39	10	4		1 8	10	5		—	—			0 3	13	0	6 4	9	9	6 31	10	0			26.2	
3	1 35	10	7		1 59	10	10		0 29	13	3		0 53	13	7	6 53	10	4	7 14	10	9			27.2	
4	2 22	11	1		2 43	11	4		1 16	13	11		1 38	14	3	7 32	11	1	7 48	11	5			28.2	
5	3 0	11	6		3 17	11	9		1 57	14	6		2 15	14	9	8 4	11	9	8 22	11	11			●	
6	3 35	11	11		3 53	12	1		2 34	14	11		2 51	15	1	8 39	12	0	8 55	12	1			0.5	
7	4 10	12	2		4 26	12	3		3 7	15	2		3 22	15	2	9 11	12	2	9 27	12	2			1.5	
8	4 42	12	3		4 59	12	3		3 38	15	3		3 54	15	2	9 43	12	2	9 59	12	2			2.5	
9	5 15	12	2		5 31	12	2		4 9	15	2		4 26	15	1	10 16	12	1	10 34	12	0			3.5	
10	5 49	12	1		6 7	12	0		4 44	15	0		5 1	14	11	10 52	11	10	11 10	11	8			4.5	
1	6 25	11	11		6 44	11	9		5 19	14	10		5 39	14	8	11 30	11	6	11 51	11	3			5.5	
2	7 3	11	7		7 24	11	5		5 59	14	5		6 21	14	2	—	—		0 12	11	0			6.5	
3	7 47	11	2		8 12	10	10		6 43	13	11		7 7	13	7	0 35	10	9	0 59	10	6			☽	
4	8 40	10	6		9 11	10	4		7 35	13	4		8 5	13	1	1 26	10	3	1 56	10	0			8.5	
5	9 46	10	2		10 24	10	3		8 38	12	11		9 17	12	11	2 30	9	11	3 9	9	10			9.5	
6	11 1	10	4		11 37	10	6		9 55	13	0		10 31	13	2	3 51	9	10	4 30	9	11			10.5	
7	—	—			0 13	10	10		11 6	13	5		11 40	13	10	5 8	10	1	5 42	10	6			11.5	
8	0 47	11	2		1 19	11	7		—	—			0 13	14	4	6 15	11	1	6 43	11	8			12.5	
9	1 48	12	0		2 15	12	6		0 42	14	10		1 10	15	6	7 6	12	4	7 29	13	0			13.5	
10	2 41	13	0		3 5	13	5		1 37	16	1		2 3	16	7	7 53	13	7	8 17	14	0			○	
1	3 30	13	10		3 54	14	1		2 29	17	0		2 51	17	3	8 39	14	3	9 2	14	4			15.5	
If Mean Spring } 6ft. 8in. Range.								8ft. 2in.								6ft. 7in.									

Equation of Time at Noon.

[illegible]

times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

JULY, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.
W.	1	morn.	11 40	9 8	—	—	10 54	26 1	11 20	26 7	5 45	21 1	6 12	2
Th.	2	0 47	0 8	9 10	0 35	10 0	11 46	26 11	—	—	6 38	21 10	7 22	2
F.	3	1 47	1 0	10 1	1 26	10 1	0 11	27 2	0 36	27 3	7 26	22 1	7 50	2
S.	4	2 43	1 50	10 1	2 14	10 1	1 0	27 2	1 24	26 10	8 14	21 9	8 39	2
S.	5	3 36	2 38	10 0	3 2	9 11	1 48	26 5	2 12	25 11	9 4	21 0	9 27	2
M.	6	4 26	3 25	9 9	3 47	9 7	2 36	25 3	2 58	24 7	9 49	19 11	10 9	2
Tu.	7	5 15	4 9	9 5	4 33	9 3	3 21	23 11	3 44	23 2	10 31	18 8	10 53	2
W.	8	6 3	4 58	9 1	5 24	8 10	4 10	22 5	4 39	21 8	11 15	17 2	11 38	2
Th.	9	6 51	5 50	8 8	6 22	8 5	5 8	21 1	5 44	20 8	—	—	0 5	2
F.	10	7 39	6 55	8 3	7 29	8 3	6 22	20 5	6 59	20 5	0 36	15 10	1 12	2
S.	11	8 28	8 5	8 3	8 40	8 4	7 34	20 6	8 9	20 8	1 53	15 8	2 32	2
S.	12	9 17	9 13	8 5	9 44	8 6	8 40	21 0	9 8	21 5	3 7	16 2	3 40	2
M.	13	10 6	10 12	8 7	10 36	8 8	9 33	21 11	9 56	22 4	4 10	17 0	4 30	2
Tu.	14	10 55	10 59	8 9	11 20	10 10	10 17	22 8	10 36	23 0	5 1	17 11	5 24	2
W.	15	11 42	11 41	8 11	—	—	10 55	23 3	11 13	23 6	5 45	18 6	6 5	2
Th.	16	0 28	0 1	9 0	0 20	9 1	11 32	23 10	11 50	24 0	6 24	19 0	6 41	2
F.	17	1 12	0 38	9 2	0 55	9 3	—	—	0 7	24 2	6 58	19 5	7 13	2
S.	18	1 55	1 12	9 3	1 29	9 4	0 23	24 4	0 39	24 5	7 29	19 7	7 44	2
S.	19	2 38	1 44	9 4	1 59	9 5	0 55	24 6	1 11	24 6	8 0	19 7	8 17	2
M.	20	3 20	2 16	9 5	2 33	9 4	1 27	24 4	1 43	24 1	8 34	19 4	8 52	2
Tu.	21	4 4	2 50	9 4	3 7	9 3	2 0	23 10	2 18	23 6	9 10	18 11	9 27	2
W.	22	4 49	3 25	9 2	3 44	9 1	2 36	23 2	2 55	22 10	9 45	18 3	10 4	2
Th.	23	5 37	4 4	9 0	4 26	8 11	3 15	22 5	3 37	21 11	10 24	17 6	10 45	2
F.	24	6 28	4 50	8 9	5 15	8 8	4 21	21 5	4 30	21 0	11 7	16 8	11 32	2
S.	25	7 23	5 44	8 6	6 19	8 5	5 2	20 8	5 41	20 8	—	—	0 3	2
S.	26	8 22	6 55	8 4	7 33	8 5	6 22	20 9	7 3	21 1	0 36	16 1	1 17	2
M.	27	9 24	8 12	8 7	8 50	8 9	7 41	21 7	8 18	22 4	2 1	16 8	2 42	2
Tu.	28	10 27	9 27	9 0	10 1	9 2	8 52	23 2	9 22	24 0	3 22	18 1	3 59	2
W.	29	11 28	10 30	9 5	10 59	9 7	9 49	24 11	10 15	25 8	4 31	19 9	5 2	2
Th.	30	morn.	11 28	9 9	11 57	9 11	10 42	26 4	11 9	26 11	5 32	21 3	6 1	2
F.	31	0 27	—	—	0 22	10 1	11 34	27 3	11 58	27 8	6 25	22 3	6 49	2

Half Mean Spring }
Range. } 4 ft. 10 in.

13 ft. 0 in.

10 ft. 6 in.

Phases of the Moon.

	D.	H.	M.	
Full - - - - -	1	6	46	Morning.
Last Quarter - -	7	10	28	Afternoon.
New - - - - -	15	10	54	Afternoon.
First Quarter -	23	9	32	Afternoon.
Full - - - - -	30	1	33	Afternoon.
In Perigee - -	1	3	0	Afternoon.
In Apogee - -	15	6	0	Afternoon.
In Perigee - -	30	1	0	Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	19	8.52	9	15	N.50	17	12	N.57	25	1	
2	16	43	10	18	43	18	9	5	26	2	
3	12	29	11	20	43	19	4	51	27	2	
4	7	33	12	21	44	20	0	23	28	2	
5	2	20	13	21	45	21	4	S.11	29	1	
6	2	N.52	14	20	48	22	8	39	30	1	
7	7	45	15	18	56	23	12	50	31		
8	12	7	16	16	17	24	16	32			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 GREENOCK add 10 m. | LIVERPOOL add 12 m. | PEMBROKE add

JULY, 1863.

WESTON-SUPER-MARE.										HOLYHEAD.										KINGSTOWN.										C's AGE AT NOON.
MORNING.					AFTERNOON.					MORNING.					AFTERNOON.					MORNING.					AFTERNOON.					
Time.		Height.			Time.		Height.			Time.		Height.			Time.		Height.			Time.		Height.			Time.		Height.			
H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.			
1	6	27	37	3	6	55	37	11	9	47	16	2	10	12	16	5	10	45	11	0	11	9	11	2	○					
2	7	22	38	7	7	40	39	0	10	36	16	7	10	58	16	8	11	34	11	3	11	59	11	3	16.2					
3	8	10	39	1	8	33	39	0	11	21	16	8	11	45	16	7	—	—	—	—	0	24	11	3	17.2					
4	8	56	38	9	9	19	38	4	—	—	—	—	0	11	16	6	0	49	11	3	1	15	11	1	18.2					
5	9	42	37	9	10	2	36	10	0	38	16	3	1	5	15	11	1	41	10	11	2	7	10	9	19.2					
6	10	21	35	11	10	40	34	9	1	31	15	6	1	56	15	2	2	32	10	6	2	56	10	4	20.2					
7	10	59	33	8	11	20	32	6	2	21	14	9	2	47	14	4	3	20	10	1	3	46	9	10	☾					
8	11	44	31	5	—	—	—	—	3	15	13	11	3	45	13	6	4	14	9	7	4	44	9	4	22.2					
9	0	10	30	5	0	41	29	7	4	16	13	2	4	53	13	0	5	14	9	2	5	45	9	0	23.2					
0	1	14	29	2	1	50	28	11	5	28	12	10	6	1	12	10	6	17	9	0	6	48	9	0	24.2					
1	2	27	28	10	3	4	29	0	6	34	12	10	7	6	12	11	7	21	9	1	7	53	9	8	25.2					
2	3	41	29	5	4	17	29	11	7	36	13	1	8	4	13	3	8	26	9	3	8	56	9	4	26.2					
3	4	49	30	8	5	17	31	5	8	29	13	6	8	52	13	9	9	25	9	6	9	50	9	7	27.2					
4	5	43	32	1	6	5	32	8	9	12	14	0	9	30	14	2	10	12	9	9	10	29	9	11	28.2					
5	6	26	33	2	6	47	33	6	9	48	14	5	10	7	14	7	10	46	10	0	11	3	10	2	●					
6	7	6	33	11	7	25	34	4	10	24	14	8	10	40	14	10	11	21	10	3	11	38	10	4	0.5					
7	7	41	34	8	7	57	34	10	10	54	14	11	11	8	14	11	11	54	10	4	—	—	—	—	—	1.5				
8	8	12	35	0	8	27	35	1	11	24	15	0	11	40	15	0	0	11	10	4	0	27	10	4	—	2.5				
9	8	42	35	3	8	58	35	2	11	56	15	0	—	—	—	0	0	43	10	4	0	59	10	4	—	3.5				
0	9	14	35	0	9	30	34	9	0	14	14	11	0	33	14	10	1	19	10	3	1	36	10	2	—	4.5				
1	9	46	34	4	10	2	33	10	0	53	14	8	1	13	14	6	1	54	10	1	2	13	9	11	—	5.5				
2	10	18	33	3	10	34	32	7	1	33	14	3	1	54	14	1	2	33	9	10	2	54	9	9	—	6.5				
3	10	52	31	11	11	13	31	2	2	16	13	10	2	40	13	7	3	15	9	7	3	39	9	5	—	☽				
4	11	36	30	6	—	—	—	—	3	7	13	3	3	37	13	1	4	5	9	4	4	35	9	2	—	8.5				
5	0	4	29	11	0	38	29	7	4	11	13	0	4	50	12	11	5	8	9	0	5	42	9	0	—	9.5				
6	1	14	29	7	1	54	29	10	5	28	13	0	6	5	13	3	6	17	9	1	6	52	9	3	—	10.5				
7	2	34	30	5	3	16	31	4	6	40	13	6	7	14	13	11	7	27	9	5	8	3	9	8	—	11.5				
8	3	58	32	6	4	37	33	9	7	48	14	4	8	18	14	10	8	39	9	11	9	14	10	2	—	12.5				
9	5	12	35	2	5	43	36	5	8	44	15	4	9	10	15	10	9	43	10	6	10	10	10	9	—	13.5				
0	6	13	37	7	6	43	38	5	9	36	16	3	10	1	16	8	10	34	11	1	10	59	11	4	—	○				
1	7	8	39	2	7	32	39	9	10	24	16	11	10	46	17	1	11	22	11	6	11	45	11	6	—	15.5				
f Mean Spring Range.					18ft. 7in.					8ft. 0in.					5ft. 6in.															

Equation of Time at Noon.

M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
3 25		9	4 49		17	5 48		25	6 13	
3 37		10	4 58		18	5 53		26	6 14	
3 48		11	5 6		19	5 57		27	6 14	
3 59		12	5 14		20	6 1		28	6 13	
4 10		13	5 22		21	6 5		29	6 12	
4 20		14	5 29		22	6 8		30	6 10	
4 30		15	5 36		23	6 10		31	6 7	
4 39		16	5 42		24	6 12				

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

JULY, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.		
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	morn.	10 23	9 6	10 48	9 7	7 37	7 9	8 2	7 11	4 50	11 3	5 17	11 6												
Th.	2	0 47	11 13	9 8	11 36	9 8	8 26	8 1	8 49	8 1	5 42	11 8	6 6	11 9												
F.	3	1 47	11 59	9 8	—	—	9 11	8 0	9 33	7 11	6 29	11 8	6 54	11 6												
S.	4	2 43	0 24	9 8	0 51	9 8	9 57	7 9	10 21	7 7	7 19	11 4	7 44	11 1												
S.	5	3 36	1 18	9 7	1 45	9 5	10 46	7 5	11 9	7 2	8 9	10 9	8 32	10 5												
M.	6	4 26	2 11	9 4	2 37	9 2	11 37	6 11	—	—	8 57	10 1	9 23	9 9												
Tu.	7	5 15	3 3	8 11	3 29	8 9	0 7	6 8	0 41	6 4	9 52	9 6	10 23	9 2												
W.	8	6 3	3 57	8 11	4 26	8 6	1 16	6 2	1 53	6 0	10 55	8 11	11 26	8 9												
Th.	9	6 51	4 55	8 4	5 26	8 3	2 29	5 10	3 4	5 10	11 59	8 7	—	—												
F.	10	7 39	5 58	8 2	6 31	8 1	3 36	5 11	4 5	6 0	0 32	11 6	1 5	8 6												
S.	11	8 28	7 6	8 0	7 40	8 1	4 34	6 1	5 1	6 2	1 39	8 6	2 12	8 7												
S.	12	9 17	8 11	8 2	8 38	8 3	5 26	6 3	5 50	6 4	2 43	11 9	3 9	8 11												
M.	13	10 6	9 3	8 5	9 26	8 7	6 13	6 5	6 36	6 6	3 33	9 2	3 54	9 4												
Tu.	14	10 55	9 47	8 9	10 6	8 10	6 58	6 8	7 18	6 9	4 14	9 7	4 33	9 10												
W.	15	11 42	10 24	8 11	10 42	8 11	7 38	6 10	7 57	6 11	4 51	10 0	5 10	10 2												
Th.	16	0 28	11 0	9 0	11 17	9 0	8 14	7 0	8 30	7 1	5 29	10 3	5 47	10 4												
F.	17	1 12	11 32	9 0	11 47	9 0	8 45	7 1	8 59	7 1	6 2	10 5	6 16	10 5												
S.	18	1 55	—	—	0 2	9 1	9 14	7 1	9 28	7 0	6 32	10 5	6 49	10 5												
S.	19	2 38	0 19	9 1	0 36	9 1	9 43	7 0	9 59	6 11	7 5	10 4	7 22	10 2												
M.	20	3 20	0 54	9 1	1 12	9 0	10 15	6 10	10 33	6 9	7 39	10 0	7 56	9 16												
Tu.	21	4 4	1 31	9 0	1 52	8 11	10 51	6 8	11 11	6 6	8 14	9 8	8 34	9 6												
W.	22	4 49	2 13	8 10	2 35	8 9	11 36	6 4	—	—	8 55	9 4	9 18	9 1												
Th.	23	5 37	2 59	8 7	3 22	8 6	0 3	6 2	0 33	5 11	9 45	8 11	10 14	8 9												
F.	24	6 28	3 49	8 5	4 17	8 4	1 6	5 10	1 42	5 9	10 46	8 8	11 20	8 7												
S.	25	7 23	4 49	8 3	5 23	8 2	2 23	5 9	3 1	5 10	11 56	8 7	—	—												
S.	26	8 22	5 58	8 2	6 35	8 2	3 36	6 0	4 9	6 3	0 32	8 8	1 9	8 9												
M.	27	9 24	7 13	8 3	7 48	8 5	4 39	6 6	5 6	6 8	1 46	9 0	2 21	9 5												
Tu.	28	10 27	8 22	8 8	8 52	8 11	5 34	6 11	6 2	7 2	2 53	9 8	3 22	10 1												
W.	29	11 28	9 19	9 2	9 46	9 5	6 30	7 5	6 58	7 7	3 47	10 6	4 12	10 12												
Th.	30	morn.	10 12	9 7	10 38	9 9	7 25	7 10	7 52	8 1	4 38	11 4	5 5	11 8												
F.	31	0 27	11 1	9 10	11 23	9 10	8 14	8 3	8 36	8 4	5 30	11 11	5 53	12 0												
Half Mean Spring } Range.			4 ft. 9 in.								3 ft. 10 in.								5 ft. 7 in.							
Phases of the Moon.											Moon's Declination at Noon.															
D. H. M.											M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'				
Full - - - - - 1 6 46 Morning.											1	19	8.52	9	15	N.50	17	12	N.57	25	19	S.26				
Last Quarter - 7 10 28 Afternoon.											2	16	43	10	18	43	18	9	5	26	31	16				
New - - - - - 15 10 54 Afternoon.											3	12	29	11	20	43	19	4	51	27	21	47				
First Quarter 23 9 32 Afternoon.											4	7	33	12	21	44	20	0	23	28	20	47				
Full - - - - - 30 1 33 Afternoon.											5	2	20	13	21	45	21	4	S.11	29	18	18				
											6	2	N.52	14	20	48	22	8	39	30	14	32				
In Perigee - - 1 3 0 Afternoon.											7	7	45	15	18	56	23	12	50	31	9	49				
In Apogee - - 15 6 0 Afternoon.											8	12	7	16	16	17	24	16	32							
In Perigee - - 30 1 0 Morning.																										

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for

BELFAST subtract 2 m.

LONDONDERRY add 4 m.

SLIGO BAY add 8 m.

JULY, 1863.

GALWAY.					QUEENSTOWN.					WATERFORD.					C's Age at Noon.								
ING.	AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.						
	Height.	Time.		Height.	I.	Height.	Time.		Height.	I.	Height.	Time.		Height.	I.	Height.	Time.		Height.	D.			
I.	H.	M.	F.	H.		M.	F.	H.	M.		F.	H.	M.	F.		H.	M.	F.	H.		M.	F.	
10	4	35	15	2	4	33	11	9	5	0	12	0	4	56	12	6	5	23	12	8	○		
5	5	26	15	7	5	27	12	2	5	53	12	3	5	48	12	10	6	13	12	11	16.2		
7	6	15	15	6	6	17	12	4	6	41	12	3	6	38	13	0	7	2	13	0	17.2		
4	7	6	15	1	7	6	12	2	7	31	11	11	7	27	12	11	7	51	12	10	18.2		
9	7	56	14	4	7	56	11	9	8	18	11	6	8	14	12	8	8	36	12	5	19.2		
11	8	46	13	4	8	39	11	2	9	0	10	10	8	57	12	2	9	17	11	10	20.2		
9	9	37	12	3	9	23	10	6	9	46	10	2	9	37	11	6	10	1	11	2	☾		
10	10	34	11	5	10	9	9	11	10	34	9	8	10	28	10	10	10	56	10	6	22.2		
3	11	43	11	11	11	7	9	5	11	40	9	3	11	27	10	3	11	58	10	0	23.2		
—	0	17	11	0	—	—	—	—	0	15	9	2	—	—	0	28	9	11	24.2				
1	1	24	11	2	0	51	9	2	1	28	9	3	1	2	9	10	1	37	9	11	25.2		
5	2	21	11	7	2	3	9	4	2	36	9	6	2	12	10	1	2	47	10	4	26.2		
10	3	12	12	2	3	4	9	9	3	30	9	11	3	19	10	6	3	46	10	8	27.2		
5	3	53	12	8	3	53	10	2	4	14	10	4	4	12	10	11	4	34	11	1	28.2		
10	4	30	13	1	4	34	10	6	4	53	10	8	4	56	11	2	5	17	11	4	●		
3	4	5	13	6	5	12	10	9	5	31	10	11	5	35	11	5	5	51	11	6	0.5		
3	8	5	37	13	9	5	48	10	11	6	4	11	0	6	8	11	7	6	24	11	8	1.5	
3	9	6	10	13	9	6	21	11	1	6	36	11	1	6	41	11	9	6	57	11	10	2.5	
3	9	6	43	13	8	6	51	11	1	7	8	11	0	7	13	11	10	7	30	11	10	3.5	
3	6	7	19	13	5	7	26	10	11	7	43	10	10	7	46	11	10	8	3	11	9	4.5	
13	3	7	58	13	0	8	1	10	8	8	18	10	7	8	20	11	8	8	36	11	6	5.5	
12	8	8	40	12	4	8	36	10	5	8	54	10	2	8	53	11	4	9	11	11	2	6.5	
12	0	9	28	11	8	9	16	10	0	9	38	9	9	9	30	11	0	9	52	10	9	☽	
11	5	10	28	11	3	10	1	9	7	10	28	9	5	10	19	10	7	10	51	10	4	8.5	
11	2	11	43	11	3	11	4	9	4	11	40	9	4	11	24	10	2	11	58	10	1	9.5	
—	0	21	11	6	—	—	—	—	0	19	9	6	—	—	0	33	10	2	10.5				
11	10	1	32	12	3	0	59	9	8	1	39	9	11	1	9	10	5	1	47	10	8	11.5	
12	9	2	36	13	4	2	18	10	4	2	53	10	8	2	29	11	1	3	7	11	6	12.5	
13	10	3	32	14	5	3	23	11	1	3	53	11	6	3	41	11	10	4	12	12	3	13.5	
9	14	11	4	25	15	4	4	21	11	10	4	49	12	2	4	43	12	7	5	12	12	10	○
9	15	9	5	12	16	0	5	14	12	5	5	39	12	6	5	36	13	0	5	59	13	2	15.5
In Spring } 7ft. 5in.					5ft. 10in.					6ft. 2in.													

Equation of Time at Noon.

S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
25	Sub.	9	4 49	Sub.	17	5 48	Sub.	25	6 13	Sub.
37		10	4 58		18	5 53		26	6 14	
48		11	5 6		19	5 57		27	6 14	
59		12	5 14		20	6 1		28	6 13	
10		13	5 22		21	6 5		29	6 12	
20		14	5 29		22	6 8		30	6 10	
30		15	5 36		23	6 10		31	6 7	
39		16	5 42		24	6 12				

f High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 8 m.

AUGUST, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.								
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.											
S.	1	1 m 22	0 43	12 2	1 7	12 2	7 26	22 3	7 49	22 3	4 16	15 5	4 38	15 5	S.	2	2 15	1 30	12 2	1 52	12 1	8 11	22 3	8 33	22 1	5 1	15 4	5 23	15 4		
M.	3	3 6	2 15	11 11	2 37	11 9	8 55	21 9	9 16	21 4	5 45	14 11	6 7	14 11	Tu.	4	3 56	2 58	11 7	3 20	11 5	9 38	20 9	9 59	20 2	6 30	14 3	6 52	13 1		
W.	5	4 45	3 41	11 2	4 1	10 10	10 19	19 6	10 42	18 9	7 15	13 3	7 38	12 1	Th.	6	5 35	4 22	10 7	4 43	10 4	11 7	18 1	11 36	17 6	8 1	12 3	8 27	11 2		
Th.	6	5 35	4 22	10 7	4 43	10 4	11 7	18 1	11 36	17 6	8 1	12 3	8 27	11 2	F.	7	6 24	5 8	10 1	5 35	9 10	—	—	0 9	16 10	8 56	11 4	9 27	11 1		
F.	7	6 24	5 8	10 1	5 35	9 10	—	—	0 9	16 10	8 56	11 4	9 27	11 1	S.	8	7 14	6 3	9 7	6 39	9 6	0 41	16 3	1 15	15 10	10 3	10 8	10 40	10 1		
S.	8	7 14	6 3	9 7	6 39	9 6	0 41	16 3	1 15	15 10	10 3	10 8	10 40	10 1	S.	9	8 3	7 20	9 5	8 1	9 6	1 48	15 8	2 25	15 9	11 19	10 6	11 55	10 1		
S.	9	8 3	7 20	9 5	8 1	9 6	1 48	15 8	2 25	15 9	11 19	10 6	11 55	10 1	M.	10	8 52	8 40	9 7	9 18	9 9	3 1	16 0	3 39	16 5	—	—	0 31	10 2		
M.	10	8 52	8 40	9 7	9 18	9 9	3 1	16 0	3 39	16 5	—	—	0 31	10 2	Tu.	11	9 39	9 51	9 11	10 19	10 2	4 13	16 11	4 39	17 4	1 3	11 3	1 29	11 1		
Tu.	11	9 39	9 51	9 11	10 19	10 2	4 13	16 11	4 39	17 4	1 3	11 3	1 29	11 1	W.	12	10 26	10 44	10 4	11 6	10 6	5 2	17 9	5 23	18 3	1 54	11 11	2 18	12 1		
W.	12	10 26	10 44	10 4	11 6	10 6	5 2	17 9	5 23	18 3	1 54	11 11	2 18	12 1	Th.	13	11 11	11 27	10 9	11 46	10 11	5 43	18 7	6 2	18 11	2 39	12 6	2 58	12 2		
Th.	13	11 11	11 27	10 9	11 46	10 11	5 43	18 7	6 2	18 11	2 39	12 6	2 58	12 2	F.	14	11 54	—	—	0 4	11 0	6 20	19 3	6 38	19 6	3 16	13 3	3 31	13 1		
F.	14	11 54	—	—	0 4	11 0	6 20	19 3	6 38	19 6	3 16	13 3	3 31	13 1	S.	15	on 37	0 21	11 1	0 36	11 2	6 54	19 9	7 10	20 0	3 46	13 7	4 1	13 1		
S.	15	on 37	0 21	11 1	0 36	11 2	6 54	19 9	7 10	20 0	3 46	13 7	4 1	13 1	S.	16	1 20	0 51	11 3	1 6	11 3	7 25	20 2	7 41	20 4	4 16	13 11	4 31	14 1		
S.	16	1 20	0 51	11 3	1 6	11 3	7 25	20 2	7 41	20 4	4 16	13 11	4 31	14 1	M.	17	2 3	1 22	11 4	1 38	11 3	7 57	20 5	8 13	20 5	4 46	14 1	5 3	14 1		
M.	17	2 3	1 22	11 4	1 38	11 3	7 57	20 5	8 13	20 5	4 46	14 1	5 3	14 1	Tu.	18	2 48	1 54	11 3	2 10	11 3	8 28	20 4	8 44	20 3	5 18	13 11	5 34	13 1		
Tu.	18	2 48	1 54	11 3	2 10	11 3	8 28	20 4	8 44	20 3	5 18	13 11	5 34	13 1	W.	19	3 34	2 26	11 2	2 43	11 1	9 0	20 1	9 19	19 9	5 51	13 8	6 10	13 1		
W.	19	3 34	2 26	11 2	2 43	11 1	9 0	20 1	9 19	19 9	5 51	13 8	6 10	13 1	Th.	20	4 24	3 1	10 11	3 20	10 10	9 38	19 5	9 57	19 0	6 30	13 2	6 50	12 1		
Th.	20	4 24	3 1	10 11	3 20	10 10	9 38	19 5	9 57	19 0	6 30	13 2	6 50	12 1	F.	21	5 16	3 39	10 8	3 58	10 6	10 16	18 7	10 40	18 1	7 12	12 7	7 36	12 1		
F.	21	5 16	3 39	10 8	3 58	10 6	10 16	18 7	10 40	18 1	7 12	12 7	7 36	12 1	S.	22	6 12	4 19	10 3	4 43	10 1	11 8	17 8	11 41	17 2	8 2	11 11	8 31	11 1		
S.	22	6 12	4 19	10 3	4 43	10 1	11 8	17 8	11 41	17 2	8 2	11 11	8 31	11 1	S.	23	7 10	5 12	9 11	5 42	9 10	—	—	0 17	16 10	9 4	11 4	9 43	11 1		
S.	23	7 10	5 12	9 11	5 42	9 10	—	—	0 17	16 10	9 4	11 4	9 43	11 1	M.	24	8 10	6 18	9 9	7 3	9 10	0 56	16 7	1 35	16 6	10 25	11 2	11 7	11 1		
M.	24	8 10	6 18	9 9	7 3	9 10	0 56	16 7	1 35	16 6	10 25	11 2	11 7	11 1	Tu.	25	9 11	7 49	9 11	8 31	10 2	2 14	16 9	2 52	17 4	11 45	11 7	—	—		
Tu.	25	9 11	7 49	9 11	8 31	10 2	2 14	16 9	2 52	17 4	11 45	11 7	—	—	W.	26	10 9	9 11	10 5	9 47	10 9	3 31	18 1	4 7	18 10	0 23	12 1	0 57	12 1		
W.	26	10 9	9 11	10 5	9 47	10 9	3 31	18 1	4 7	18 10	0 23	12 1	0 57	12 1	Th.	27	11 6	10 21	11 1	10 48	11 5	4 40	19 8	5 5	20 4	1 30	13 3	2 0	13 1		
Th.	27	11 6	10 21	11 1	10 48	11 5	4 40	19 8	5 5	20 4	1 30	13 3	2 0	13 1	F.	28	12 0	11 13	11 9	11 38	12 0	5 29	20 11	5 54	21 6	2 25	14 2	2 50	14 1		
F.	28	12 0	11 13	11 9	11 38	12 0	5 29	20 11	5 54	21 6	2 25	14 2	2 50	14 1	S.	29	morn.	—	—	0 2	12 2	6 19	21 10	6 42	22 3	3 12	15 0	3 34	15 1		
S.	29	morn.	—	—	0 2	12 2	6 19	21 10	6 42	22 3	3 12	15 0	3 34	15 1	S.	30	0 53	0 24	12 3	0 46	12 3	7 5	22 5	7 27	22 6	3 56	15 6	4 17	15 1		
S.	30	0 53	0 24	12 3	0 46	12 3	7 5	22 5	7 27	22 6	3 56	15 6	4 17	15 1	M.	31	1 44	1 8	12 3	1 30	12 2	7 49	22 5	8 9	22 3	4 38	15 6	4 58	15 1		
M.	31	1 44	1 8	12 3	1 30	12 2	7 49	22 5	8 9	22 3	4 38	15 6	4 58	15 1	Half Mean Spring } 5ft 9in. Range.																
Phases of the Moon.																Moon's Declination at Noon.															
D. H. M.																M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'				
Last Quarter - 6 10 5 Morning.																1	48	36	9	21	N. 42	17	22	58	25	19	5				
New - - - - 14 2 3 Afternoon.																2	0	N. 46	10	21	1	18	7	26	26	16	1				
First Quarter - 22 6 20 Morning.																3	5	56	11	19	25	19	11	40	27	11	1				
Full - - - - 28 8 55 Afternoon.																4	10	37	12	16	59	20	15	26	28	6	1				
																5	14	38	13	13	51	21	18	30	29	1	1				
In Apogee - - 11 11 0 Afternoon.																6	17	50	14	10	8	22	20	37	30	3	1				
In Perigee - - 27 9 0 Morning.																7	20	6	15	5	59	23	21	33	31	8	1				
																8	21	24	16	1	34	24	21	8							

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

AUGUST, 1863.

MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
	MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	
1	—	—	0 19 20	0	1 30 16	11	1 54 17	0	3 2 19	11	3 25 20	2	16.5
2	0 42 20	0	1 5 19	10	2 16 17	0	2 38 16	11	3 46 20	3	4 7 20	3	17.5
3	1 29 19	8	1 51 19	4	2 59 16	10	3 20 16	8	4 29 20	1	4 50 19	11	18.5
4	2 14 19	0	2 35 18	5	3 41 16	4	4 3 16	0	5 12 19	7	5 34 19	3	19.5
5	2 56 17	10	3 17 17	2	4 23 15	7	4 44 15	1	5 53 18	10	6 14 18	5	20.5
6	3 38 16	6	4 0 15	11	5 6 14	8	5 29 14	2	6 36 17	10	7 1 17	4	21.5
7	4 24 15	3	4 49 14	7	5 55 13	9	6 24 13	4	7 26 16	10	7 52 16	5	22.5
8	5 19 14	1	5 51 13	10	6 56 12	11	7 32 12	9	8 23 15	11	9 1 15	8	23.5
9	6 28 13	9	7 7 13	11	8 12 12	8	8 53 11	9	9 40 15	5	10 20 15	4	24.5
10	7 48 14	3	8 23 14	8	9 32 12	11	10 11 13	2	11 0 15	5	11 36 15	7	25.5
11	8 51 15	1	9 16 15	6	10 44 13	5	11 10 13	9	—	—	0 11 15	10	26.5
12	9 40 15	11	10 2 16	4	11 33 14	1	11 55 14	4	0 38 16	1	1 2 16	5	27.5
13	10 22 16	8	10 41 17	1	—	—	0 15 14	7	1 24 16	10	1 43 17	2	28.5
14	10 59 17	4	11 17 17	8	0 33 14	10	0 51 15	1	2 2 17	6	2 20 17	9	29.5
15	11 34 17	10	11 51 18	0	1 8 15	3	1 23 15	6	2 36 18	1	2 53 18	4	30.9
16	—	—	0 8 18	2	1 38 15	7	1 54 15	8	3 8 18	6	3 22 18	8	31.9
17	0 25 18	3	0 43 18	4	2 8 15	9	2 23 15	9	3 38 18	10	3 52 18	11	32.9
18	1 0 18	4	1 18 18	3	2 39 15	9	2 54 15	9	4 9 18	11	4 23 18	11	33.9
19	1 36 18	2	1 54 18	0	3 9 15	8	3 25 15	6	4 41 18	10	4 56 18	8	34.9
20	2 13 17	9	2 33 17	5	3 43 15	4	4 2 15	2	5 14 18	6	5 33 18	4	35.9
21	2 53 17	0	3 14 16	6	4 21 14	10	4 41 14	6	5 51 18	1	6 12 17	9	36.9
22	3 37 16	1	4 3 15	7	5 4 14	2	5 30 13	11	6 34 17	4	6 59 17	0	37.9
23	4 30 15	2	5 2 14	9	5 59 13	7	6 32 13	4	7 25 16	8	7 58 16	5	38.9
24	5 38 14	8	6 16 14	9	7 12 13	2	7 56 13	3	8 40 16	2	9 25 16	1	39.9
25	6 58 15	2	7 41 15	10	8 41 13	5	9 23 13	10	10 7 16	2	10 51 16	5	40.9
26	8 19 16	6	8 52 17	2	10 3 14	3	10 38 14	9	11 31 16	9	—	—	41.9
27	9 22 17	10	9 48 18	6	11 11 15	3	11 37 15	8	0 8 17	3	0 39 17	9	42.9
28	10 14 19	1	10 40 19	6	—	—	0 1 16	1	1 6 18	4	1 33 18	10	43.9
29	11 5 19	11	11 30 20	1	0 25 16	6	0 48 16	10	1 56 19	3	2 19 19	8	44.9
30	11 53 20	2	—	—	1 11 17	1	1 34 17	11	2 42 20	0	3 3 20	3	45.9
31	0 16 20	2	0 39 20	0	1 55 17	2	2 15 17	11	3 25 20	5	3 46 20	4	46.9
if Mean Spring } Range.				9ft. 4in.	8ft. 0in.				9ft. 7in.				

Equation of Time at Noon.

M.	S.	Sub.	M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.	M. D.	M.	S.	Sub.
6	4		9	5	18		17	3	56		25	2	1	
6	0		10	5	10		18	3	44		26	1	45	
5	56		11	5	1		19	3	31		27	1	28	
5	51		12	4	52		20	3	17		28	1	11	
5	46		13	4	42		21	2	3		29	0	53	
5	40		14	4	31		22	2	48		30	0	35	
5	33		15	4	20		23	2	33		31	0	17	
5	26		16	4	8		24	2	17					

as of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
 Dover subtract 3 m. SHEERNESS subtract 3 m. LONDON 0 m.

AUGUST, 1863.

Week Day.	Month Day.	Moon's Transit.	GREENOCK.								LIVERPOOL.								PEMBROKE.																						
			Morning.				Afternoon.				Morning.				Afternoon.				Morning.				Afternoon.																		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																					
		H. M.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.																						
S.	1	1m22	0 46	10 2	1 10	10 3	—	—	0 21	27 10	7 11	22 8	7 33	22 7																											
S.	2	2 15	1 33	10 3	1 55	10 2	0 44	27 10	1 6	27 7	7 55	22 4	8 17	22 6																											
M.	3	3 6	2 17	10 2	2 37	10 0	1 27	27 2	1 47	26 7	8 38	21 7	9 02	21 4																											
Tu.	4	3 56	2 59	9 10	3 18	9 8	2 8	25 11	2 29	25 1	9 21	20 4	9 39	19 3																											
W.	5	4 45	3 37	9 6	3 59	9 3	2 49	24 3	3 10	23 5	9 59	18 9	10 19	18 4																											
Th.	6	5 35	4 21	9 0	4 44	8 10	3 32	22 6	3 55	21 7	10 40	17 3	11 2	16 4																											
F.	7	6 24	5 10	8 7	5 37	8 4	4 24	20 9	4 55	19 11	11 25	15 7	11 55	15 2																											
S.	8	7 14	6 11	8 2	6 47	8 0	5 32	19 6	6 13	19 3	—	—	0 28	14 9																											
S.	9	8 3	7 26	7 11	8 6	8 0	6 57	19 4	7 36	19 6	1 10	14 8	1 54	14 6																											
M.	10	8 52	8 46	8 1	9 20	8 3	8 14	19 11	8 47	20 6	2 37	15 2	3 14	15 1																											
Tu.	11	9 39	9 49	8 5	10 14	8 6	9 13	21 1	9 35	21 8	3 45	16 3	4 12	16 1																											
W.	12	10 26	10 37	8 8	10 59	8 9	9 57	22 3	10 16	22 10	4 37	17 5	5 1	18 6																											
Th.	13	11 11	11 19	8 11	11 39	9 0	10 54	23 3	10 52	23 9	5 23	18 6	5 43	18 12																											
F.	14	11 54	11 57	9 2	—	—	11 9	24 1	11 26	24 6	6 1	19 4	6 18	19 6																											
S.	15	on37	0 14	9 3	0 30	9 5	11 42	24 11	11 57	25 1	6 33	20 0	6 48	20 2																											
S.	16	1 20	0 45	9 6	1 1	9 6	—	—	0 12	25 4	7 3	20 5	7 19	20 4																											
M.	17	2 3	1 18	9 7	1 35	9 7	0 28	25 5	0 45	25 5	7 35	20 5	7 50	20 5																											
Tu.	18	2 48	1 50	9 7	2 6	9 7	1 12	25 5	1 16	25 3	8 6	20 4	8 23	20 1																											
W.	19	3 34	2 21	9 7	2 40	9 6	1 32	24 11	1 49	24 7	8 41	19 10	9 0	19 4																											
Th.	20	4 24	2 58	9 5	3 16	9 3	2 7	24 2	2 26	23 8	9 18	19 1	9 36	18 6																											
F.	21	5 16	3 34	9 2	3 56	9 0	2 45	23 1	3 7	22 6	9 56	18 0	10 18	17 2																											
S.	22	6 12	4 20	8 10	4 47	8 9	3 31	21 11	3 59	21 3	10 42	16 11	11 7	16 6																											
S.	23	7 10	5 17	8 7	5 52	8 5	4 32	20 9	5 12	20 4	11 38	15 11	—	—																											
M.	24	8 10	6 32	8 4	7 14	8 4	5 56	20 4	6 44	20 1	0 15	15 10	0 57	15 10																											
Tu.	25	9 11	7 57	8 6	8 38	8 8	7 26	21 3	8 7	22 1	1 45	16 4	2 30	17 6																											
W.	26	10 9	9 16	8 11	9 50	9 2	8 41	23 0	9 13	24 1	3 10	17 11	3 48	18 10																											
Th.	27	11 6	10 19	9 5	10 45	9 7	9 39	25 0	10 3	25 10	4 19	19 10	4 48	20 8																											
F.	28	12 0	11 11	9 10	11 37	10 0	10 26	26 7	10 50	27 1	5 15	21 5	5 41	22 9																											
S.	29	morn.	—	—	0 1	10 2	11 13	27 8	11 37	27 11	6 5	22 5	6 28	22 9																											
S.	30	0 53	0 24	10 3	0 47	10 4	11 59	28 1	—	—	6 50	22 10	7 11	22 10																											
M.	31	1 44	1 10	10 4	1 31	10 3	0 20	28 0	0 41	27 10	7 31	22 7	7 51	22 8																											
Half Mean Spring Range.			4 ft. 10 in.								13 ft. 0 in.								10 ft. 6 in.																						
Phases of the Moon.																					Moon's Declination at Noon.																				
D H. M.																					M.D. ° ' "																				
Last Quarter - 6 10 5 Morning.																					1 48.36 9 21N.42 17 28.58 25 19 8.19																				
New - - - - 14 2 3 Afternoon.																					2 0N.46 10 21 1 18 7 26 26 16 10																				
First Quarter - 22 6 20 Morning.																					3 5 56 11 19 25 19 11 40 27 11 57																				
Full - - - - 28 8 55 Afternoon.																					4 10 37 12 16 59 20 15 26 28 6 59																				
In Apogee - - 11 11 0 Afternoon.																					5 14 38 13 13 51 21 18 30 29 1 39																				
In Perigee - - 27 9 0 Morning.																					6 17 50 14 10 8 22 20 37 30 3 40																				
																					7 20 6 15 5 59 23 21 33 31 8 38																				
																					21 24 16 1 34 24 21 8																				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —

GREENOCK add 19 m.

LIVERPOOL add 12 m.

PEMBROKE add 20 m.

AUGUST, 1863.

NORTH SHIELDS.										LEITH.										THURSO.										C's AGE AT NOON.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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Equation of Time at Noon.

M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
6	4		9	5	18		17	3	56		25	2	1	
6	0		10	5	10		18	3	44		26	1	45	
5	56		11	5	1		19	3	31		27	1	28	
5	51		12	4	52		20	3	17		28	1	11	
5	46		13	4	42		21	3	3		29	0	53	
5	40		14	4	31		22	2	48		30	0	35	
5	33		15	4	20		23	2	33		31	0	17	
5	26		16	4	8		24	2	17					

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

AUGUST, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
S.	1	1m22	0 46	10 2	1 10	10 3	—	—	0 21	27 10	7 11	22 8	7 33	22	—	—	0 21	27 10	7 11	22 8	7 33	22				
S.	2	2 15	1 33	10 3	1 55	10 2	0 44	27 10	1 6	27 7	7 55	22 4	8 17	22	—	—	1 6	27 7	7 55	22 4	8 17	22				
M.	3	3 6	2 17	10 2	2 37	10 0	1 27	27 2	1 47	26 7	8 38	21 7	9 0	21	—	—	1 47	26 7	8 38	21 7	9 0	21				
Tu.	4	3 56	2 59	9 10	3 18	9 8	2 8	25 11	2 29	25 1	9 21	20 4	9 39	19	—	—	2 29	25 1	9 21	20 4	9 39	19				
W.	5	4 45	3 37	9 6	3 59	9 3	2 49	24 3	3 10	23 5	9 59	18 9	10 19	18	—	—	3 10	23 5	9 59	18 9	10 19	18				
Th.	6	5 35	4 21	9 0	4 44	8 10	3 32	23 6	3 55	21 7	10 40	17 3	11 2	16	—	—	3 55	21 7	10 40	17 3	11 2	16				
F.	7	6 24	5 10	8 7	5 37	8 4	4 24	20 9	4 55	19 11	11 25	15 7	11 55	15	—	—	4 55	19 11	11 25	15 7	11 55	15				
S.	8	7 14	6 11	8 2	6 47	8 0	5 32	19 0	6 13	19 3	—	—	0 28	14	—	—	6 13	19 3	—	—	0 28	14				
S.	9	8 3	7 26	7 11	8 6	8 0	6 57	19 4	7 36	19 6	1 10	14 8	1 54	14	—	—	7 36	19 6	1 10	14 8	1 54	14				
M.	10	8 52	8 46	8 1	9 20	8 3	8 14	19 11	8 47	20 6	2 37	15 2	3 14	15	—	—	8 47	20 6	2 37	15 2	3 14	15				
Tu.	11	9 39	9 49	8 5	10 14	8 6	9 13	21 1	9 35	21 8	3 45	16 3	4 12	16	—	—	9 35	21 8	3 45	16 3	4 12	16				
W.	12	10 26	10 37	8 11	10 59	8 9	9 57	22 3	10 16	22 10	4 37	17 5	5 1	18	—	—	10 16	22 10	4 37	17 5	5 1	18				
Th.	13	11 11	11 19	8 11	11 39	9 0	10 34	23 3	10 52	23 9	5 23	18 6	5 43	18	—	—	10 52	23 9	5 23	18 6	5 43	18				
F.	14	11 54	11 57	9 2	—	—	11 9	24 1	11 26	24 6	6 1	19 4	6 18	19	—	—	11 26	24 6	6 1	19 4	6 18	19				
S.	15	0 37	0 14	9 3	0 30	9 5	11 42	24 11	11 57	25 1	6 33	20 0	6 48	20	—	—	11 57	25 1	6 33	20 0	6 48	20				
S.	16	1 20	0 45	9 6	1 1	9 6	—	—	0 12	25 4	7 3	20 5	7 19	20	—	—	0 12	25 4	7 3	20 5	7 19	20				
M.	17	2 3	1 18	9 7	1 35	9 7	0 28	25 5	0 45	25 5	7 35	20 5	7 50	20	—	—	0 45	25 5	7 35	20 5	7 50	20				
Tu.	18	2 48	1 50	9 7	2 6	9 7	1 1	25 5	1 16	25 3	8 6	20 4	8 23	20	—	—	1 16	25 3	8 6	20 4	8 23	20				
W.	19	3 34	2 21	9 7	2 40	9 6	1 32	24 11	1 49	24 7	8 41	19 10	9 0	19	—	—	1 49	24 7	8 41	19 10	9 0	19				
Th.	20	4 24	2 58	9 5	3 16	9 3	2 7	24 2	2 26	23 8	9 18	19 1	9 36	18	—	—	2 26	23 8	9 18	19 1	9 36	18				
F.	21	5 16	3 34	9 2	3 56	9 0	2 45	23 1	3 7	22 6	9 56	18 0	10 18	17	—	—	3 7	22 6	9 56	18 0	10 18	17				
S.	22	6 12	4 20	8 10	4 47	8 9	3 31	21 11	3 59	21 3	10 42	16 11	11 7	16	—	—	3 59	21 3	10 42	16 11	11 7	16				
S.	23	7 10	5 17	7 7	5 52	8 5	4 32	20 9	5 12	20 4	11 38	15 11	—	—	—	—	5 12	20 4	11 38	15 11	—	—				
M.	24	8 10	6 32	7 4	7 14	8 4	5 56	20 4	6 44	20 8	0 15	15 10	0 57	15	—	—	6 44	20 8	0 15	15 10	0 57	15				
Tu.	25	9 11	7 57	8 6	8 38	8 8	7 26	21 3	8 7	22 1	1 45	16 4	2 30	17	—	—	8 7	22 1	1 45	16 4	2 30	17				
W.	26	10 9	9 16	11 11	9 50	9 2	8 41	23 0	9 13	24 1	3 10	17 11	3 48	18	—	—	9 13	24 1	3 10	17 11	3 48	18				
Th.	27	11 6	10 19	9 5	10 45	9 7	9 39	25 0	10 3	25 10	4 19	19 10	4 48	20	—	—	10 3	25 10	4 19	19 10	4 48	20				
F.	28	12 0	11 11	9 10	11 37	10 0	10 26	26 7	10 50	27 1	5 15	21 5	5 41	22	—	—	10 50	27 1	5 15	21 5	5 41	22				
S.	29	morn.	—	—	0 1	10 2	11 13	27 8	11 37	27 11	6 5	22 5	6 28	23	—	—	11 37	27 11	6 5	22 5	6 28	23				
S.	30	0 53	0 24	10 3	0 47	10 4	11 59	28 1	—	—	6 50	22 10	7 11	23	—	—	—	—	6 50	22 10	7 11	23				
M.	31	1 44	1 10	10 4	1 31	10 3	0 20	28 0	0 41	27 10	7 31	22 7	7 51	23	—	—	0 41	27 10	7 31	22 7	7 51	23				
Half Mean Spring Range.			4 ft. 10 in.								13 ft. 0 in.								10 ft. 6 in.							
Phases of the Moon.											Moon's Declination at Noon.															
D H. M.											M.D. ° '															
Last Quarter - 6 10 5 Morning.											1 48.36 9 21N.42 17 28.58 25 19S.19															
New - - - - - 14 2 3 Afternoon.											2 0N.46 10 21 1 18 7 26 26 16 10															
First Quarter - 22 6 20 Morning.											3 5 56 11 19 25 19 11 40 27 11 57															
Full - - - - - 28 8 55 Afternoon.											4 10 37 12 16 59 20 15 26 28 6 59															
											5 14 38 13 13 51 21 18 30 29 1 39															
In Apogee - - 11 11 0 Afternoon.											6 17 50 14 10 8 22 20 37 30 3N.40															
In Perigee - - 27 9 0 Morning.											7 20 6 15 5 59 23 21 33 31 8 38															
											21 24 16 1 34 24 21 8															

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 GREENOCK add 10 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

AUGUST, 1863.

ESTON-SUPER-MARE.					HOLYHEAD.					KINGSTOWN.					C's AOB AT NOON.								
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.											
Time.	Height.	Time.	Height.		Time.	Height.	Time.	Height.		Time.	Height.	Time.	Height.										
M. P. L.	H. M. F. I.	H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.									
55	39	11	8	17	39	11	11	7	17	1	11	29	17	0	—	—	0	9	11	6	16.5		
38	39	8	8	59	39	3	11	52	16	10	—	—	0	32	11	5	0	55	11	4	17.5		
18	38	7	9	38	37	9	0	15	16	8	0	37	16	4	1	18	11	2	1	40	11	0	18.5
56	36	7	10	13	35	4	1	1	15	11	1	24	15	5	2	3	10	9	2	25	10	6	19.5
30	34	0	10	47	32	8	1	46	14	11	2	9	14	5	2	46	10	2	3	9	9	11	20.5
7	31	5	11	30	30	0	2	33	13	11	3	0	13	5	3	33	9	8	3	58	9	4	21
57	28	10	—	—	—	—	3	31	12	11	4	3	12	6	4	29	9	1	5	1	8	10	22.5
31	27	11	1	6	27	6	4	41	12	3	5	20	12	2	5	35	8	8	6	9	8	7	23.5
48	27	4	2	29	27	5	5	59	12	2	6	36	12	3	6	45	8	8	7	22	8	9	24.5
9	27	11	3	48	28	7	7	12	12	6	7	43	12	9	7	59	8	11	8	33	9	1	25.5
22	29	6	4	51	30	4	8	9	13	1	8	31	13	5	9	1	9	3	9	27	9	5	26.5
18	31	4	5	42	32	3	8	53	13	9	9	11	14	1	9	51	9	8	10	11	9	10	27.5
4	33	1	6	24	33	9	9	29	14	5	9	46	14	8	10	29	10	0	10	44	10	2	28.5
43	34	5	7	0	34	11	10	3	14	11	10	18	15	2	11	0	10	4	11	15	10	6	29
16	35	6	7	32	36	0	10	32	15	4	10	45	15	6	11	30	10	11	11	44	10	8	30.9
47	36	3	8	2	36	5	10	59	15	7	11	14	15	7	12	0	10	8	—	—	—	—	1.9
18	36	6	8	33	36	6	11	30	15	7	11	47	15	6	0	17	10	8	0	34	10	8	2.9
48	36	5	9	3	36	2	—	—	—	—	0	4	15	5	0	50	10	8	1	7	10	7	3.9
20	35	9	9	37	35	3	0	21	15	4	0	41	15	1	1	24	10	5	1	43	10	4	4.9
53	34	6	10	9	33	8	1	1	14	10	1	22	14	7	2	2	10	2	2	22	10	0	5.9
26	32	9	10	46	31	10	1	43	14	3	2	8	13	11	2	43	9	10	3	7	9	7	6.9
9	30	10	11	37	30	0	2	34	13	6	3	4	13	2	3	33	9	5	4	3	9	3	7
—	—	—	0	12	29	4	3	39	12	11	4	21	12	9	4	37	9	1	5	16	8	11	8.9
51	29	1	1	35	29	4	5	4	12	10	5	47	13	0	5	55	8	11	6	34	9	1	9.9
19	30	0	3	3	31	0	6	26	13	4	7	4	13	9	7	13	9	4	7	51	9	7	10.9
45	32	3	4	26	33	9	7	37	14	3	8	9	14	10	8	28	9	11	9	3	10	3	11.9
0	35	3	5	29	36	8	8	35	15	5	8	58	15	11	9	33	10	6	9	57	10	10	12.9
56	37	10	6	22	38	9	9	21	16	5	9	44	16	9	10	19	11	1	10	41	11	4	13.9
47	39	6	7	11	39	11	10	6	17	0	10	27	17	2	11	3	11	7	11	24	11	8	14.9
33	40	4	7	54	40	2	10	47	17	3	11	6	17	2	11	46	11	8	—	—	—	—	15.9
14	39	11	8	34	39	4	11	26	17	0	11	47	16	9	0	8	11	7	0	30	11	5	16.9
in Spring }		18ft. 7in.					8ft. 0in.					5ft. 6in.											

Equation of Time at Noon.

L. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
4		9	5 18		17	3 56		25	2 1	
0		10	5 10		18	3 44		26	1 45	
56		11	5 1		19	3 31		27	1 28	
51		12	4 52		20	3 17		28	1 11	
46		13	4 42		21	3 3		29	0 53	
40		14	4 31		22	2 48		30	0 35	
33		15	4 20		23	2 33		31	0 17	
26		16	4 8		24	2 17				

[High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 ESTON-SUPER-MARE add 18 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

SEPTEMBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.
Tu.	1	2m35	5 43	19 9	6 2	19 3	7 43	15 9	8 0	15 8	1 24	13 3	1 44	13 1
W.	2	3 26	6 20	18 6	6 39	17 9	8 18	15 2	8 36	14 9	2 2	12 9	2 21	12 1
Th.	3	4 17	6 59	16 9	7 20	15 11	8 52	14 3	9 9	13 9	2 40	12 0	3 0	11 1
F.	4	5 7	7 42	15 0	8 8	14 1	9 28	13 4	9 47	12 8	3 20	11 3	3 40	10 1
S.	5	5 57	8 35	13 4	9 8	12 10	10 9	12 5	10 35	11 7	4 5	10 5	4 31	10 1
S.	6	6 47	9 48	12 6	10 31	12 5	11 2	11 8	11 42	11 0	5 3	9 8	5 41	9 1
M.	7	7 35	11 16	12 6	11 57	12 10	—	—	0 25	11 7	6 21	9 4	7 5	9 1
Tu.	8	8 22	—	—	0 35	13 3	1 7	11 3	1 47	12 3	7 44	9 7	8 24	9 1
W.	9	9 7	1 8	13 11	1 33	14 6	2 25	11 10	2 58	13 1	8 59	10 3	9 25	10 1
Th.	10	9 51	1 54	15 3	2 13	16 0	3 29	12 9	3 54	13 10	9 48	10 11	10 8	11 1
F.	11	10 35	2 32	16 8	2 48	17 3	4 16	13 6	4 37	14 6	10 27	11 7	10 43	11 1
S.	12	11 18	3 4	17 10	3 20	18 1	4 56	14 2	5 14	15 1	11 0	12 1	11 16	12 1
S.	13	0 22	3 36	18 7	3 52	18 10	5 31	14 9	5 48	15 5	11 32	12 5	11 48	12 1
M.	14	0 46	4 8	19 0	4 25	19 1	6 5	15 2	6 22	15 7	—	—	0 4	12 1
Tu.	15	1 33	4 41	19 2	4 57	19 1	6 40	15 4	6 55	15 5	0 22	12 8	0 39	12 1
W.	16	2 21	5 14	18 11	5 31	18 9	7 9	15 2	7 25	15 1	0 57	12 7	1 13	12 1
Th.	17	3 13	5 49	18 5	6 6	18 1	7 43	14 11	8 0	14 8	1 32	12 5	1 49	12 1
F.	18	4 7	6 26	17 7	6 46	16 11	8 18	14 6	8 37	14 1	2 7	12 2	2 28	12 1
S.	19	5 4	7 10	16 3	7 37	15 6	8 56	14 0	9 20	13 5	2 47	11 8	3 10	11 1
S.	20	6 2	8 6	14 10	8 39	14 4	9 45	13 5	10 10	12 8	3 35	11 1	4 3	10 1
M.	21	7 0	9 18	14 1	10 3	14 11	10 46	12 11	11 24	12 2	4 35	10 6	5 12	10 1
Tu.	22	7 57	10 51	14 3	11 36	14 9	—	—	0 9	12 10	5 55	10 2	6 40	10 1
W.	23	8 53	—	—	0 17	15 4	0 57	12 5	1 43	13 7	7 23	10 7	8 5	10 1
Th.	24	9 47	0 51	16 3	1 22	17 1	2 25	13 4	3 0	14 6	8 42	11 5	9 14	11 1
F.	25	10 39	1 49	17 11	2 12	18 9	3 31	14 3	4 0	15 5	9 43	12 3	10 7	12 1
S.	26	11 31	2 33	19 6	2 55	20 1	4 26	15 1	4 52	16 1	10 29	12 11	10 51	12 1
S.	27	morn.	3 16	20 5	3 36	20 6	5 14	15 10	5 36	16 5	11 13	13 3	11 33	13 1
M.	28	0 22	3 58	20 6	4 19	20 5	5 58	16 1	6 19	16 5	11 54	13 4	—	—
Tu.	29	1 14	4 38	20 2	4 57	19 10	6 38	16 1	6 55	15 11	0 16	13 3	0 37	13 1
W.	30	2 5	5 16	19 4	5 34	18 9	7 12	15 8	7 30	15 4	0 57	13 0	1 16	12 1
Half Mean Spring } Range.			9ft. 6in.				7ft. 9in.				6ft. 4in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°
Last Quarter -	5	1	9	Morning.	1	13 N.	1	9	14 N.	40	17	17 S.	40	25
New - - - - -	13	4	42	Morning.	2	16	35	10	11	9	18	19	59	26
First Quarter -	20	1	33	Afternoon.	3	19	14	11	7	8	19	21	12	27
Full - - - - -	27	6	2	Morning.	4	20	52	12	2	47	20	21	9	28
							5	21	28	13	18.44	21	19	46
In Apogee - -	8	11	0	Morning.	6	21	5	14	6	15	22	17	8	29
In Perigee - -	24	8	0	Morning.	7	19	45	15	10	33	23	13	25	30
							8	17	35	16	14	27	24	8

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required.

Brest add 18 m.

1

DEVONPORT add 17 m.

1

PORTSMOUTH add 4 m.

AUGUST, 1863.

MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	D.						
1	5 35	16 1	5 58	16 0	6 2	12 7	6 25	12 7	6 23	13 3	6 46	13 3	16.5												
2	6 21	15 9	6 43	15 7	6 47	12 5	7 9	12 3	7 9	13 2	7 30	13 1	17.5												
3	7 5	15 2	7 27	14 9	7 30	12 0	7 51	11 9	7 50	12 11	8 11	12 8	18.5												
4	7 49	14 3	8 11	13 8	8 11	11 5	8 30	11 0	8 30	12 5	8 48	12 0	19.5												
5	8 34	13 0	8 57	12 4	8 49	10 7	9 10	10 3	9 7	11 7	9 25	11 3	20.5												
6	9 22	11 9	9 50	11 2	9 32	9 10	9 55	9 5	9 46	10 10	10 13	10 5	21.5												
7	10 21	10 8	10 57	10 5	10 22	9 1	10 56	8 10	10 44	10 0	11 17	9 8	22.5												
8	11 35	10 4	—	—	11 32	8 9	—	—	11 50	9 6	—	—	23.5												
9	0 15	10 4	0 53	10 5	0 12	8 8	0 52	8 9	0 26	9 5	1 3	9 6	24.5												
10	1 30	10 8	2 1	11 0	1 33	8 11	2 10	9 1	1 42	9 8	2 19	9 11	25.5												
11	2 26	11 5	2 50	11 9	2 41	9 4	3 6	9 7	2 52	10 3	3 20	10 5	26.5												
12	3 13	12 1	3 33	12 6	3 31	9 11	3 53	10 2	3 47	10 8	4 11	10 11	27.5												
13	3 51	12 10	4 9	13 2	4 13	10 5	4 32	10 8	4 33	11 2	4 54	11 5	28.5												
14	4 26	13 6	4 41	13 10	4 49	10 11	5 6	11 1	5 12	11 7	5 29	11 9	29.5												
15	4 56	14 1	5 11	14 3	5 22	11 3	5 38	11 4	5 44	11 11	5 58	12 0	30.9												
16	5 27	14 4	5 43	14 5	5 54	11 5	6 10	11 6	6 14	12 1	6 31	12 2	31.9												
17	6 0	14 5	6 16	14 4	6 26	11 6	6 42	11 6	6 48	12 2	7 4	12 3	32.9												
18	6 32	14 3	6 49	14 1	6 58	11 5	7 14	11 4	7 19	12 2	7 35	12 2	33.9												
19	7 8	13 11	7 27	13 7	7 32	11 2	7 51	11 0	7 53	12 1	8 10	11 11	34.9												
20	7 47	13 3	8 8	12 11	8 8	10 9	8 27	10 6	8 27	11 9	8 45	11 6	35.9												
21	8 32	12 5	8 58	11 11	8 46	10 3	9 10	9 11	9 4	11 3	9 24	11 0	36.9												
22	9 26	11 6	9 58	11 3	9 34	9 8	10 1	9 6	9 50	10 8	10 21	10 5	37.9												
23	10 36	11 0	11 19	11 0	10 36	9 4	11 17	9 3	10 58	10 2	11 36	10 0	38.9												
24	—	—	0 3	11 3	12 0	9 4	—	—	—	—	0 15	10 0	39.9												
25	0 43	11 7	1 22	12 1	0 43	9 6	1 27	9 10	0 54	10 3	1 35	10 7	40.9												
26	1 55	12 8	2 27	13 4	2 6	10 3	2 42	10 8	2 16	11 0	2 57	11 6	41.9												
27	2 55	13 11	3 19	14 6	3 13	11 1	3 39	11 6	3 29	11 11	3 57	12 4	42.9												
28	3 43	15 0	4 7	15 5	4 5	11 11	4 30	12 3	4 26	12 8	4 53	12 11	43.9												
29	4 29	15 10	4 51	16 1	4 54	12 6	5 18	12 7	5 16	13 1	5 38	13 3	44.9												
30	5 13	16 3	5 35	16 2	5 40	12 8	6 2	12 8	6 0	13 4	6 22	13 4	45.9												
31	5 56	16 0	6 17	15 8	6 22	12 7	6 43	12 4	6 43	13 3	7 4	13 1	46.9												
at Mean Spring } Range.				7ft. 5in.	5ft. 10in.				6ft. 2in.																

Equation of Time at Noon.

M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
6 4		9	5 18		17	3 56		25	2 1	
6 0		10	5 10		18	3 44		26	1 45	
5 56		11	5 1		19	3 31		27	1 28	
5 51		12	4 52		20	3 17		28	1 11	
5 46		13	4 42		21	3 3		29	0 53	
5 40		14	4 31		22	2 48		30	0 35	
5 33		15	4 20		23	2 33		31	0 17	
5 26		16	4 8		24	2 17				

of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.

SEPTEMBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRAMIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.
Tu.	1	2m35	5 43	19 9	6 2	19 3	7 43	15 9	8 0	15 8	1 24	13 3	1 44	11
W.	2	3 26	6 20	18 6	6 39	17 9	8 18	15 2	8 36	14 9	2 2	12 9	2 31	11
Th.	3	4 17	6 59	16 9	7 20	15 11	8 52	14 3	9 9	13 9	2 40	12 0	3 0	11
F.	4	5 7	7 42	15 0	8 8	14 1	9 28	13 4	9 47	12 11	3 20	11 3	3 40	10
S.	5	5 57	8 35	13 4	9 8	12 10	10 9	12 5	10 35	11 7	4 5	10 5	4 31	10
S.	6	6 47	9 48	12 6	10 31	12 5	11 2	11 8	11 42	11 0	5 3	9 8	5 41	11
M.	7	7 35	11 16	12 6	11 57	12 10	—	—	0 25	11 7	6 21	9 4	7 5	11
Tu.	8	8 22	—	—	0 35	13 3	1 7	11 3	1 47	12 11	7 44	9 7	8 24	11
W.	9	9 7	1 8	13 11	1 33	14 6	2 25	11 10	2 58	13 1	8 59	10 3	9 25	11
Th.	10	9 51	1 54	15 3	2 13	16 0	3 29	12 9	3 54	13 10	9 48	10 11	10 8	11
F.	11	10 35	2 32	16 8	2 48	17 3	4 16	13 6	4 37	14 6	10 27	11 7	10 43	11
S.	12	11 18	3 4	17 10	3 20	18 1	4 56	14 2	5 14	15 1	11 0	12 1	11 16	11
S.	13	0 22	3 36	18 7	3 52	18 10	5 31	14 9	5 48	15 5	11 32	12 5	11 48	11
M.	14	0 46	4 8	19 0	4 25	19 1	6 5	15 2	6 22	15 7	—	—	0 4	11
Tu.	15	1 33	4 41	19 2	4 57	19 1	6 40	15 4	6 55	15 5	0 22	12 8	0 39	11
W.	16	2 21	5 14	18 11	5 31	18 9	7 9	15 2	7 25	15 1	0 57	12 7	1 13	11
Th.	17	3 13	5 49	18 5	6 6	18 1	7 43	14 11	8 0	14 8	1 32	12 5	1 49	11
F.	18	4 7	6 26	17 7	6 46	16 11	8 18	14 6	8 37	14 1	2 7	12 2	2 28	11
S.	19	5 4	7 10	16 3	7 37	15 6	8 56	14 0	9 20	13 5	2 47	11 8	3 10	11
S.	20	6 2	8 6	14 10	8 39	14 4	9 45	13 5	10 10	12 8	3 35	11 1	4 3	11
M.	21	7 0	9 18	14 1	10 3	14 11	10 46	12 11	11 24	12 2	4 35	10 6	5 12	11
Tu.	22	7 57	10 51	14 3	11 36	14 9	—	—	0 9	12 10	5 55	10 2	6 40	11
W.	23	8 53	—	—	0 17	15 4	0 57	12 5	1 43	13 7	7 23	10 7	8 5	11
Th.	24	9 47	0 51	16 3	1 22	17 1	2 25	13 4	3 0	14 6	8 42	11 5	9 14	11
F.	25	10 39	1 49	17 11	2 12	18 9	3 31	14 3	4 0	15 5	9 43	12 3	10 7	11
S.	26	11 31	2 33	19 6	2 55	20 1	4 26	15 1	4 52	16 1	10 29	12 11	10 51	11
S.	27	morn.	3 16	20 5	3 36	20 6	5 14	15 10	5 36	16 5	11 13	13 3	11 33	11
M.	28	0 22	3 58	20 6	4 19	20 5	5 58	16 1	6 19	16 5	11 54	13 4	—	11
Tu.	29	1 14	4 38	20 2	4 57	19 10	6 38	16 1	6 55	15 11	0 16	13 3	0 37	11
W.	30	2 5	5 16	19 4	5 34	18 9	7 12	15 8	7 30	15 4	0 57	13 0	1 16	11
Half Mean Spring Range.			9 ^{ft.} 6 ^{in.}				7 ^{ft.} 9 ^{in.}				6 ^{ft.} 4 ^{in.}			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°
Last Quarter - 5 1 9 Morning.							1	13	N. 1	9	14	N. 40	17	17 5. 40
New - - - - - 13 4 42 Morning.							2	16	35	10	11	9	18	19 59
First Quarter - 20 1 33 Afternoon.							3	19	14	11	7	8	19	21 12
Full - - - - - 27 6 2 Morning.							4	20	52	12	2	47	20	21 9
							5	21	28	13	1	5. 44	21	19 46
In Apogee - - 8 11 0 Morning.							6	21	5	14	6	15	22	17 8
In Perigee - - 24 8 0 Morning.							7	19	45	15	10	33	23	13 25
							8	17	35	16	14	27	24	8 52

The times of High Water are given for Mean Time at Place, if Greenwich or Railway Time be required.
 Brest add 18 m. | Devonport add 17 m. | Portsmouth add 4 m.

SEPTEMBER, 1863.

DOVER.					SHEERNESS.					LONDON.					C's Agl. at Noon. D.										
MORNING.			AFTERNOON.		MORNING.			AFTERNOON.		MORNING.			AFTERNOON.												
m.	H.	F.	L.	Time.	Height.	H.	M.	F.	L.	Time.	Height.	H.	M.	F.		L.	Time.	Height.	H.	M.	F.	L.			
1	19		9	1	22	19	5	2	35	16	11	2	54	16	9	4	6	20	2	4	25	20	0	17	9
42	19		0	2	1	18	6	3	12	16	5	3	31	16	1	4	44	19	8	5	4	19	4	18	9
21	17		10	2	42	17	2	3	50	15	8	4	9	15	2	5	23	18	10	5	43	18	5	19	9
1	16		6	3	21	15	9	4	30	14	8	4	50	14	2	6	2	17	11	6	23	17	4	20	9
6	15		1	4	10	14	5	5	14	13	8	5	42	13	3	6	47	16	9	7	13	16	3		
0	13		10	5	14	13	5	6	11	12	10	6	47	12	6	7	43	15	10	8	17	15	5	22	9
1	13		3	6	31	13	5	7	29	12	4	8	13	12	4	8	57	15		9	39	15	0	23	9
0	13		9	7	50	14	2	8	56	12	6	9	35	12	10	10	21	15		11	2	15	3	24	9
1	14		9	8	48	15	3	10	12	13	2	10	44	13	6	11	39	15	6	—	—	—	—	25	9
1	15		9	9	31	16	3	11	7	13	9	11	28	14	3	0	11	15	10	0	34	16	3	26	9
1	16		9	10	9	17	2	11	46	14	7	—	—	—	—	0	55	16	8	1	15	17	1	27	9
7	17		7	10	44	17	11	0	4	14	11	0	20	15	2	1	34	17	6	1	51	17	10	28	9
1	18		3	11	20	18	5	0	37	15	6	0	53	15	9	2	8	18	2	2	23	18	6		
7	18		7	11	55	18	8	1	9	15	11	1	24	16	1	2	38	18	9	2	52	19	0	1	3
				0	13	18	9	1	40	16	2	1	56	16	2	3	9	19	1	3	25	19	3	2	3
1	18		9	0	50	18	8	2	12	16	2	2	28	16	1	3	42	19	3	3	57	19	3	3	3
0	18		6	1	29	18	4	2	44	16	0	3	1	15	10	4	14	19		4	31	19	0	4	3
7	18		1	2	8	17	9	3	18	15	8	3	36	15	5	4	48	18	10	5	8	18	7	5	3
9	17		3	2	51	16	9	3	56	15	2	4	17	14	9	5	28	18	4	5	50	18	0	6	3
6	16		3	3	44	15	8	4	40	14	4	5	7	14	0	6	12	17	6	6	39	17	1		
4	15		2	4	48	14	10	5	39	13	8	6	15	13	4	7	7	16	9	7	44	16	5	8	3
17	14		8	6	7	14	9	6	57	13	2	7	45	13	3	8	27	16	2	9	13	16	1	9	3
19	15		3	7	31	15	11	8	32	13	5	9	14	13	9	9	57	16	2	10	40	16	6	10	3
7	16		7	8	37	17	3	9	54	14	4	10	26	14	9	11	20	16	10	11	56	17	3	11	3
6	17		11	9	31	18	6	10	56	15	3	11	22	15	8	—	—	—	—	0	24	17	10	12	3
55	19		0	10	19	19	5	11	44	16	1	—	—	—	—	0	50	18	4	1	13	18	10	13	3
41	19		8	11	5	19	9	0	6	16	6	0	28	16	9	1	36	19	3	1	57	19	7		
27	19		10	11	49	19	9	0	49	16	11	1	9	17	0	2	19	19	10	2	39	20	0	15	3
—	—			0	11	19	7	1	30	16	11	1	50	16	10	3	0	20	1	3	19	20	0	16	3
32	19		4	0	53	19	0	2	9	16	8	2	28	16	6	3	39	19	11	3	58	19	8	17	3
Low Spring age.		9 ft. 4 in.			8 ft. 0 in.			9 ft. 7 in.																	

Equation of Time at Noon.

M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
1	2	Add.	9	2 39	Add.	17	5 26	Add.
21			10	3 0		18	5 47	
40			11	3 20		19	6 8	
59			12	3 41		20	6 29	
19			13	4 2		21	6 50	
39			14	4 23		22	7 11	
59			15	4 44		23	7 32	
19			16	5 5		24	7 53	

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 Down subtract 5 m. / Summer subtract 8 m. / London 6 m.

SEPTEMBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.																								
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																				
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																	
			H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.																	
Tu.	1	2 m 35	1 51	10 2	2 9	10 0	1 1	27 4	1 20	26 9	8 10	21 8	8 29	2	3	26	2 28	9 10	2 46	9 8	1 38	26 0	1 56	25 2	8 48	20 5	9 7																
W.	2	3 26	2 28	9 10	2 46	9 8	1 38	26 0	1 56	25 2	8 48	20 5	9 7	3	4	17	3 4	9 5	3 24	9 3	2 15	24 4	2 35	23 4	9 26	18 9	9 44																
Th.	3	4 17	3 4	9 5	3 24	9 3	2 15	24 4	2 35	23 4	9 26	18 9	9 44	4	5	7	3 43	9 0	4 4	8 9	2 54	22 5	3 15	21 6	10 3	17 1	10 25																
F.	4	5 7	3 43	9 0	4 4	8 9	2 54	22 5	3 15	21 6	10 3	17 1	10 25	5	5	57	4 30	8 6	4 56	8 3	3 42	20 6	4 10	19 8	10 48	15 10	11 16																
S.	5	5 57	4 30	8 6	4 56	8 3	3 42	20 6	4 10	19 8	10 48	15 10	11 16	6	6	47	5 28	8 1	6 7	7 11	4 46	19 0	5 29	18 8	11 50	14 3	—																
S.	6	6 47	5 28	8 1	6 7	7 11	4 46	19 0	5 29	18 8	11 50	14 3	—	7	7	35	6 47	7 9	7 30	7 9	6 14	18 7	7 0	18 10	0 28	14 2	1 14																
M.	7	7 35	6 47	7 9	7 30	7 9	6 14	18 7	7 0	18 10	0 28	14 2	1 14	8	8	22	8 9	7 11	8 47	8 1	7 39	19 3	8 16	19 10	1 58	14 6	2 39																
Tu.	8	8 22	8 9	7 11	8 47	8 1	7 39	19 3	8 16	19 10	1 58	14 6	2 39	9	9	7	9 21	8 3	9 46	8 5	8 47	20 7	9 10	21 3	3 15	15 9	3 42																
W.	9	9 7	9 21	8 3	9 46	8 5	8 47	20 7	9 10	21 3	3 15	15 9	3 42	10	9	51	10 9	8 8	10 29	8 10	9 30	22 1	9 48	22 9	4 7	17 2	4 29																
Th.	10	9 51	10 9	8 8	10 29	8 10	9 30	22 1	9 48	22 9	4 7	17 2	4 29	11	10	35	10 48	8 11	11 6	9 1	10 5	23 5	10 21	23 11	4 50	18 6	5 9																
F.	11	10 35	10 48	8 11	11 6	9 1	10 5	23 5	10 21	23 11	4 50	18 6	5 9	12	11	18	11 24	9 3	11 41	9 4	10 38	24 6	10 55	24 11	5 28	19 7	5 46																
S.	12	11 18	11 24	9 3	11 41	9 4	10 38	24 6	10 55	24 11	5 28	19 7	5 46	13	12	2	11 59	9 6	—	—	11 11	25 4	11 27	25 8	6 3	20 5	6 18																
S.	13	0 2	11 59	9 6	—	—	11 11	25 4	11 27	25 8	6 3	20 5	6 18	14	0	46	0 16	9 7	0 32	9 8	11 43	25 11	12 0	26 0	6 34	20 11	6 51																
M.	14	0 46	0 16	9 7	0 32	9 8	11 43	25 11	12 0	26 0	6 34	20 11	6 51	15	1	33	0 49	9 9	1 6	9 9	—	—	0 17	26 1	7 7	21 2	7 23																
Tu.	15	1 33	0 49	9 9	1 6	9 9	—	—	0 17	26 1	7 7	21 2	7 23	16	2	21	1 23	9 9	1 40	9 9	0 34	26 1	0 51	25 11	7 40	20 10	7 58																
W.	16	2 21	1 23	9 9	1 40	9 9	0 34	26 1	0 51	25 11	7 40	20 10	7 58	17	3	13	1 57	9 9	2 15	9 8	1 8	25 7	1 25	25 2	8 16	20 4	8 34																
Th.	17	3 13	1 57	9 9	2 15	9 8	1 8	25 7	1 25	25 2	8 16	20 4	8 34	18	4	7	2 33	9 6	2 52	9 5	1 42	24 9	2 2	24 2	8 54	19 6	9 13																
F.	18	4 7	2 33	9 6	2 52	9 5	1 42	24 9	2 2	24 2	8 54	19 6	9 13	19	5	4	3 11	9 3	3 33	9 1	2 22	23 6	2 44	23 10	9 34	18 3	9 57																
S.	19	5 4	3 11	9 3	3 33	9 1	2 22	23 6	2 44	23 10	9 34	18 3	9 57	20	6	2	3 59	8 11	4 28	8 9	3 10	22 1	3 39	21 4	10 24	17 0	10 51																
S.	20	6 2	3 59	8 11	4 28	8 9	3 10	22 1	3 39	21 4	10 24	17 0	10 51	21	7	0	5 0	8 7	5 38	8 5	4 15	20 9	4 56	20 4	11 24	15 11	—																
M.	21	7 0	5 0	8 7	5 38	8 5	4 15	20 9	4 56	20 4	11 24	15 11	—	22	7	57	6 21	8 4	7 6	8 4	5 45	20 4	6 35	20 9	0 4	15 10	0 48																
Tu.	22	7 57	6 21	8 4	7 6	8 4	5 45	20 4	6 35	20 9	0 4	15 10	0 48	23	8	53	7 48	8 6	8 29	8 9	7 18	21 5	7 57	22 2	1 36	16 5	2 20																
W.	23	8 53	7 48	8 6	8 29	8 9	7 18	21 5	7 57	22 2	1 36	16 5	2 20	24	9	47	9 4	9 0	9 35	9 3	8 29	23 2	8 58	24 2	2 58	18 0	3 32																
Th.	24	9 47	9 4	9 0	9 35	9 3	8 29	23 2	8 58	24 2	2 58	18 0	3 32	25	10	39	10 4	9 5	10 28	9 7	9 24	25 0	9 46	25 10	4 3	19 10	4 30																
F.	25	10 39	10 4	9 5	10 28	9 7	9 24	25 0	9 46	25 10	4 3	19 10	4 30	26	11	31	10 52	9 9	11 16	9 11	10 8	26 6	10 30	27 0	4 55	21 4	5 20																
S.	26	11 31	10 52	9 9	11 16	9 11	10 8	26 6	10 30	27 0	4 55	21 4	5 20	27	morn.	11 38	10 0	12 0	10 1	10 51	27 3	11 12	27 6	5 43	22 2	6 4	—																
S.	27	morn.	11 38	10 0	12 0	10 1	10 51	27 3	11 12	27 6	5 43	22 2	6 4	28	0	22	—	—	0 21	10 2	11 33	27 7	11 54	27 6	6 24	22 5	6 45																
M.	28	0 22	—	—	0 21	10 2	11 33	27 7	11 54	27 6	6 24	22 5	6 45	29	1	14	0 43	10 2	1 4	10 1	—	—	0 14	27 3	7 5	22 2	7 24	—															
Tu.	29	1 14	0 43	10 2	1 4	10 1	—	—	0 14	27 3	7 5	22 2	7 24	30	2	5	1 23	10 0	1 42	9 11	0 34	26 10	0 53	26 2	7 42	21 3	8 1																
W.	30	2 5	1 23	10 0	1 42	9 11	0 34	26 10	0 53	26 2	7 42	21 3	8 1																														
Half Mean Spring Range.			4 ft. 10 in.				13 ft. 0 in.				10 ft. 6 in.																																
Phases of the Moon.										Moon's Declination at Noon.																																	

SEPTEMBER, 1863.

NORTH SHIELDS.						LEITH.						THURSO.						C's AGE AT NOON.		
MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.					
Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.				
2 13 9	13	9	5 41 13 5	41	13	5	4 16 16 11	16	11	4 36 16 7	36	16	7 10 26 13 6	26	13	6 10 47 13 0	47	13	0	17.9
2 13 1	13	1	6 21 12 8	21	12	8	4 55 16 2	55	16	2 5 15 15 8	15	15	8 11 7 12 6	7	12	6 11 28 11 11	28	11	11	18.9
4 12 2	12	2	7 2 11 8	2	11	8	5 36 15 2	36	15	2 5 59 14 6	59	14	6 11 50 11 4	50	11	4	—	—		19.9
24 11 2	11	2	7 50 10 7	50	10	7	6 21 13 11	21	13	11 6 45 13 4	45	13	4 0 12 10 9	12	10	9 0 37 10 2	37	10	2	20.9
20 10 0	10	0	8 51 9 7	51	9	7	7 15 12 9	15	12	9 7 45 12 3	45	12	3 1 6 9 8	6	9	8 1 36 9 3	36	9	3	(
30 9 3	9	3	10 12 9 1	12	9	1	8 22 11 11	22	11	11 9 5 11 8	5	11	8 2 14 8 10	14	8	10 2 58 8 7	58	8	7	22.9
52 9 2	9	2	11 34 9 3	34	9	3	9 47 11 8	47	11	8 10 27 11 9	27	11	9 3 44 8 6	44	8	6 4 27 8 7	27	8	7	23.9
—	—	—	0 11 9 6	11	9	6	11 4 12 0	4	12	0 11 38 12 4	38	12	4 5 5 8 8	5	5	8 5 40 9 0	40	9	0	24.9
5 9 10	9	10	1 15 10 2	15	10	2	—	—	—	0 0 9 12 9	9	12	9 6 11 9 5	11	9	5 6 33 9 11	33	9	11	25.9
7 10 6	10	6	1 56 10 11	56	10	11	0 31 13 2	31	13	2 0 50 13 8	50	13	8 6 51 10 6	51	10	6 7 6 11 0	6	11	0	26.9
4 11 3	11	3	2 32 11 9	32	11	9	1 9 14 2	9	14	2 1 27 14 8	27	14	8 7 21 11 6	21	11	6 7 35 12 0	35	12	0	27.9
7 12 1	12	1	3 2 12 5	2	12	5	1 43 15 1	43	15	1 1 59 15 5	59	15	5 7 49 12 5	49	12	5 8 4 12 9	4	12	9	28.9
7 12 8	12	8	3 32 12 11	32	12	11	2 15 15 9	15	15	9 2 31 16 0	31	16	0 8 19 13 0	19	13	0 8 33 13 2	33	13	2	●
3 13 1	13	1	4 3 13 3	3	13	3	2 45 16 2	45	16	2 3 0 16 3	0	16	3 8 48 13 3	48	13	3 9 4 13 3	4	13	3	1.3
13 3	13	3	4 37 13 3	37	13	3	3 16 16 4	16	16	4 3 32 16 3	32	16	3 9 21 13 3	21	13	3 9 38 13 2	38	13	2	2.3
13 1	13	1	5 11 12 11	11	12	11	3 48 16 2	48	16	2 4 5 16 0	5	16	0 9 55 13 0	55	13	0 10 14 12 10	14	12	10	3.3
12 9	12	9	5 48 12 7	48	12	7	4 23 15 10	23	15	10 4 43 15 7	43	15	7 10 34 12 6	34	12	6 10 53 12 3	53	12	3	4.3
12 5	12	5	6 27 12 1	27	12	1	5 2 15 4	2	15	4 5 23 15 1	23	15	1 11 15 11 10	15	11	10 11 37 11 5	37	11	5	5.3
11 9	11	9	7 14 11 4	14	11	4	5 45 14 8	45	14	8 6 11 14 2	11	14	2 — —	—	—	0 0 2 11 0	2	11	0	6.3
10 11	11	1	8 17 10 5	17	10	5	6 38 13 8	38	13	8 7 12 13 3	12	13	3 0 30 10 7	30	10	7 1 3 10 2	3	10	2)
10 2	10	2	9 40 10 0	40	10	0	7 50 12 11	50	12	11 8 32 12 9	32	12	9 1 41 9 11	41	9	11 2 24 9 8	24	9	8	8.3
10 1	10	1	1 10 10 4	10	10	4	9 20 12 9	20	12	9 10 4 12 11	4	12	11 3 15 9 8	15	9	8 4 3 9 9	3	9	9	9.3
10 9	10	9	—	—	—	—	10 44 13 4	44	13	4 11 20 13 9	20	13	9 4 45 10 0	45	10	0 5 22 10 5	22	10	5	10.3
11 2	11	2	0 57 11 7	57	11	7	11 52 14 3	52	14	3 — —	—	—	0 5 53 11 0	53	11	0 6 20 11 8	20	11	8	11.3
12 1	12	1	1 50 12 6	50	12	6	0 19 14 11	19	14	11 0 44 15 6	44	15	6 6 43 12 4	43	12	4 7 3 13 0	3	13	0	12.3
13 0	13	0	2 33 13 6	33	13	6	1 7 16 1	7	16	1 1 29 16 7	29	16	7 7 21 13 6	21	13	6 7 40 14 0	40	14	0	13.3
3 13 10	13	10	3 13 14 0	13	14	0	1 51 17 0	51	17	0 2 12 17 3	12	17	3 8 0 14 3	0	14	3 8 19 14 4	19	14	4	○
3 14 2	14	2	3 53 14 2	53	14	2	2 31 17 4	31	17	4 2 50 17 4	50	17	4 8 38 14 3	38	14	3 8 58 14 2	58	14	2	15.3
4 14 1	14	1	4 34 13 10	34	13	10	3 10 17 2	10	17	2 3 30 16 11	30	16	11 9 19 13 11	19	13	11 9 39 13 7	39	13	7	16.3
4 13 6	13	6	5 14 13 2	14	13	2	3 49 16 7	49	16	7 4 8 16 3	8	16	3 9 58 13 3	58	13	3 10 18 12 9	18	12	9	17.3
Spring } 6ft. 8in.						8ft. 2in.						6ft. 7in.								

Equation of Time at Noon.

S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
2		9	2 39		17	5 26		25	8 14	
21		10	3 0		18	5 47		26	8 34	
40		11	3 20		19	6 8		27	8 55	
59		12	3 41		20	6 29		28	9 15	
1 19		13	4 2		21	6 50		29	9 35	
1 39		14	4 23		22	7 11		30	9 54	
1 59		15	4 44		23	7 32				
2 19		16	5 5		24	7 53				

of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required—for
NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

SEPTEMBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRAMIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
Tu.	1	2 m 35	1 51	10 2	2 9	10 0	1 1	27 4	1 20	26 9	8 10	21 8	8 29	
W.	2	3 26	2 28	9 10	2 46	9 8	1 38	26 0	1 56	25 2	8 48	20 5	9 7	
Th.	3	4 17	3 4	9 5	3 24	9 3	2 15	24 4	2 35	23 4	9 26	18 9	9 44	
F.	4	5 7	3 43	9 0	4 4	8 9	2 54	22 5	3 15	21 6	10 3	17 1	10 25	
S.	5	5 57	4 30	8 6	4 56	8 3	3 42	20 6	4 10	19 8	10 48	15 10	11 16	
S.	6	6 47	5 28	8 1	6 7	7 11	4 46	19 0	5 29	18 8	11 50	14 3	—	
M.	7	7 35	6 47	7 9	7 30	7 9	6 14	18 7	7 0	18 10	0 28	14 2	1 14	
Tu.	8	8 22	8 9	7 11	8 47	8 1	7 39	19 3	8 16	19 10	1 58	14 6	2 39	
W.	9	9 7	9 21	8 3	9 46	8 5	8 47	20 7	9 10	21 3	3 15	15 9	3 42	
Th.	10	9 51	10 9	8 11	10 29	8 10	9 30	22 1	9 48	22 9	4 7	17 2	4 29	
F.	11	10 35	10 48	8 11	11 6	9 1	10 5	23 5	10 21	23 11	4 50	18 6	5 9	
S.	12	11 18	11 24	9 3	11 41	9 4	10 38	24 6	10 55	24 11	5 28	19 7	5 46	
S.	13	0 8 2	11 59	9 6	—	—	11 11	25 4	11 27	25 8	6 3	20 5	6 18	
M.	14	0 46	0 16	9 7	0 32	9 8	11 43	25 11	12 0	26 0	6 34	20 11	6 51	
Tu.	15	1 33	0 49	9 9	1 6	9 9	—	—	0 17	26 1	7 7	21 2	7 23	
W.	16	2 21	1 23	9 9	1 40	9 9	0 34	26 1	0 51	25 11	7 40	20 10	7 58	
Th.	17	3 13	1 57	9 9	2 15	9 8	1 8	25 7	1 25	25 2	8 16	20 4	8 34	
F.	18	4 7	2 33	9 6	2 52	9 5	1 42	24 9	2 2	24 2	8 54	19 6	9 13	
S.	19	5 4	3 11	9 3	3 33	9 1	2 22	23 6	2 44	22 10	9 34	18 3	9 57	
S.	20	6 2	3 59	8 11	4 28	8 9	3 10	22 1	3 39	21 4	10 24	17 0	10 51	
M.	21	7 0	5 0	8 7	5 38	8 5	4 15	20 9	4 56	20 4	11 24	15 11	—	
Tu.	22	7 57	6 21	8 4	7 6	8 4	5 45	20 4	6 35	20 9	0 4	15 10	0 48	
W.	23	8 53	7 48	8 6	8 29	8 9	7 18	21 5	7 57	22 2	1 36	16 5	2 20	
Th.	24	9 47	9 4	9 0	9 35	9 3	8 29	23 2	8 58	24 2	2 58	18 0	3 32	
F.	25	10 39	10 4	9 5	10 28	9 7	9 24	25 0	9 46	25 10	4 3	19 10	4 30	
S.	26	11 31	10 52	9 9	11 16	9 11	10 8	26 6	10 30	27 0	4 55	21 4	5 20	
S.	27	11 11	11 38	10 0	12 0	10 1	10 51	27 3	11 12	27 6	5 43	22 2	6 4	
M.	28	0 22	—	—	0 21	10 2	11 33	27 7	11 54	27 6	6 24	22 5	6 45	
Tu.	29	1 14	0 43	10 2	1 4	10 1	—	—	0 14	27 3	7 5	22 2	7 24	
W.	30	2 5	1 23	10 0	1 42	9 11	0 34	26 10	0 53	26 2	7 42	21 3	8 1	

Half Mean Spring } 4^{ft.} 10^{in.}
Range.13^{ft.} 0^{in.}10^{ft.} 6^{in.}

Phases of the Moon.

	D.	H.	M.	
Last Quarter -	5	1	9	Morning.
New - - - - -	13	4	42	Morning.
First Quarter -	20	1	33	Afternoon.
Full - - - - -	27	6	2	Morning.
In Apogee - -	8	11	0	Morning.
In Perigee - -	24	8	0	Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	13	N. 1	9	14	N. 40	17	17	S. 40	25		
2	16	35	10	11	9	18	19	59	26		
3	19	14	11	7	8	19	21	12	27		
4	20	52	12	2	47	20	21	9	28		
5	21	28	13	1	44	21	19	46	29		
6	21	5	14	6	15	22	17	8	30		
7	19	45	15	10	33	23	13	25			
8	17	35	16	14	27	24	8	52			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required

GREENOCK add 19 m.

LIVERPOOL add 12 m.

PEMBROKE add 20 m.

SEPTEMBER, 1863.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	D.	
Tu.	1	6 36 15 3	6 56 14 10	7 2 12 1	7 21 11 9	7 23 12 11	7 41 12 8	17.9						
W.	2	7 15 14 3	7 35 13 9	7 39 11 5	7 57 11 0	7 59 12 4	8 17 12 0	18.9						
Th.	3	7 56 13 1	8 18 12 4	8 16 10 8	8 34 10 2	8 35 11 7	8 51 11 2	19.9						
F.	4	8 42 11 8	9 8 11 0	8 55 9 9	9 18 9 4	9 9 10 9	9 32 10 4	20.9						
S.	5	9 37 10 6	10 12 10 1	9 41 9 0	10 12 8 8	9 59 9 11	10 35 9 7	21.9						
M.	6	10 53 9 10	11 36 9 10	10 52 8 6	11 33 8 5	11 12 9 3	11 50 9 2	22.9						
Tu.	7	— — — —	0 18 10 0	— — — —	0 16 8 6	— — — —	0 29 9 3	23.9						
W.	8	0 55 10 3	1 30 10 7	0 56 8 8	1 35 8 11	1 7 9 4	1 44 9 7	24.9						
Th.	9	2 1 11 0	2 23 11 6	2 10 9 2	2 38 9 5	2 20 9 11	2 49 10 3	25.9						
F.	10	2 44 12 0	3 4 12 5	3 1 9 9	3 22 10 2	3 15 10 7	3 38 10 11	26.9						
S.	11	3 23 12 10	3 39 13 3	3 42 10 6	4 0 10 9	4 0 11 3	4 20 11 6	27.9						
M.	12	3 55 13 8	4 11 14 0	4 17 10 11	4 34 11 3	4 39 11 9	4 57 11 11	28.9						
Tu.	13	4 27 14 4	4 42 14 7	4 51 11 5	5 8 11 8	5 14 12 1	5 29 12 3	29.9						
W.	14	4 57 14 9	5 14 14 10	5 24 11 9	5 42 11 9	5 44 12 4	6 1 12 5	30.9						
Th.	15	5 31 14 11	5 48 14 10	5 58 11 10	6 15 11 9	6 19 12 6	6 36 12 6	31.9						
F.	16	6 6 14 8	6 24 14 6	6 32 11 9	6 50 11 7	6 53 12 5	7 11 12 4	32.9						
S.	17	6 42 14 3	7 1 14 0	7 8 11 5	7 26 11 3	7 28 12 3	7 45 12 1	33.9						
M.	18	7 22 13 7	7 44 13 2	7 45 11 0	8 4 10 8	8 3 11 11	8 22 11 8	34.9						
Tu.	19	8 8 12 8	8 35 12 1	8 24 10 4	8 48 10 0	8 42 11 4	9 3 11 1	35.9						
W.	20	9 6 11 7	9 41 11 2	9 16 9 9	9 45 9 6	9 30 10 9	10 4 10 5	36.9						
Th.	21	10 22 11 0	11 8 11 1	10 23 9 4	11 6 9 3	10 44 10 2	11 26 10 0	37.9						
F.	22	11 54 11 3	— — — —	11 52 9 4	— — — —	— — — —	0 6 10 1	38.9						
S.	23	0 35 11 8	1 12 12 2	0 35 9 7	1 17 9 11	0 46 10 4	1 25 10 8	39.9						
M.	24	1 43 12 9	2 11 13 5	1 54 10 3	2 27 10 8	2 4 11 1	2 40 11 6	40.9						
Tu.	25	2 39 13 11	3 3 14 6	2 57 11 1	3 22 11 6	3 12 11 11	3 40 12 3	41.9						
W.	26	3 25 14 11	3 46 15 4	3 46 11 10	4 9 12 2	4 6 12 7	4 31 12 10	42.9						
Th.	27	4 8 15 7	4 28 15 10	4 31 12 4	4 52 12 5	4 54 13 0	5 15 13 1	43.9						
F.	28	4 47 15 11	5 8 15 10	5 14 12 6	5 36 12 5	5 35 13 1	5 56 13 1	44.9						
S.	29	5 29 15 8	5 49 15 4	5 56 12 4	6 15 12 2	6 16 13 0	6 36 12 10	45.9						
M.	30	6 8 14 11	6 27 14 6	6 34 11 11	6 53 11 7	6 56 12 8	7 15 12 5	46.9						

Half Mean Spring } 7ft. 5in.
Range.

5ft. 10in.

6ft. 2in.

Equation of Time at Noon.

M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
1	0 2	Add.	9	2 39	Add.	17	5 26	Add.	25	8 14	Add.
2	0 21		10	3 0		18	5 47		26	8 34	
3	0 40		11	3 20		19	6 8		27	8 55	
4	0 59		12	3 41		20	6 29		28	9 15	
5	1 19		13	4 2		21	6 50		29	9 35	
6	1 39		14	4 23		22	7 11		30	9 54	
7	1 59		15	4 44		23	7 32				
8	2 19		16	5 5		24	7 53				

Times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. **QUEENSTOWN add 8 m.** **WATERFORD add 3 m.**

SEPTEMBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.							
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.					
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.				
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.				
Tu.	1	2m35	0 26	9 9	0 46	9 7	9 52	7 9	10 10	7 6	7 15	11 3	7 34	10 10				
W.	2	3 26	1 7	9 5	1 28	9 3	10 29	7 3	10 49	6 11	7 53	10 6	8 11	10 10				
Th.	3	4 17	1 49	9 1	2 12	8 10	11 12	6 7	11 39	6 2	8 33	9 7	8 55	9 10				
F.	4	5 7	2 36	8 8	3 1	8 5	—	—	0 9	5 10	9 22	8 9	9 54	8 10				
S.	5	5 57	3 29	8 3	3 57	8 1	0 46	5 6	1 23	5 4	10 26	8 0	11 4	7 10				
S.	6	6 47	4 33	7 11	5 11	7 10	2 7	5 2	2 49	5 2	11 45	7 9	—	—				
M.	7	7 35	5 50	7 9	6 32	7 8	3 28	5 4	4 5	5 6	0 24	7 8	1 6	7 10				
Tu.	8	8 22	7 10	7 9	7 46	7 11	4 37	5 8	5 7	5 10	1 43	7 11	2 19	8 10				
W.	9	9 7	8 17	8 1	8 40	8 3	5 33	6 1	5 52	6 3	2 50	8 6	3 11	8 10				
Th.	10	9 51	9 0	8 6	9 18	8 8	6 10	6 6	6 28	6 8	3 30	9 3	3 46	9 10				
F.	11	10 35	9 36	8 10	9 53	9 0	6 47	6 11	7 4	7 1	4 3	9 11	4 18	10 10				
S.	12	11 18	10 9	9 2	10 25	9 3	7 21	7 3	7 38	7 5	4 35	10 6	4 51	10 10				
S.	13	0a 2	10 40	9 4	10 55	9 5	7 54	7 6	8 8	7 8	5 8	11 0	5 24	11 10				
M.	14	0 46	11 10	9 5	11 25	9 5	8 23	7 9	8 38	7 9	5 40	11 3	5 55	11 10				
Tu.	15	1 33	11 41	9 5	11 57	9 5	8 53	7 8	9 8	7 7	6 11	11 3	6 27	11 10				
W.	16	2 21	—	—	0 15	9 5	9 24	7 6	9 41	7 4	6 45	11 0	7 3	10 10				
Th.	17	3 13	0 34	9 4	0 53	9 3	9 57	7 3	10 15	7 1	7 21	10 6	7 39	10 10				
F.	18	4 7	1 12	9 2	1 35	9 1	10 36	6 10	10 58	6 7	7 59	10 0	8 20	9 10				
S.	19	5 4	2 0	8 11	2 26	8 9	11 28	6 4	—	—	8 45	9 4	9 16	9 10				
S.	20	6 2	2 54	8 7	3 26	8 5	0 2	6 0	0 43	5 9	9 51	8 9	10 31	8 10				
M.	21	7 0	4 2	8 3	4 43	8 2	1 28	5 8	2 17	5 8	11 14	8 5	11 59	8 10				
Tu.	22	7 57	5 26	8 2	6 8	8 2	3 3	5 10	3 43	6 1	—	—	0 43	8 10				
W.	23	8 53	6 50	8 3	7 28	8 5	4 19	6 5	4 49	6 1	1 23	8 11	2 1	9 10				
Th.	24	9 47	8 0	8 8	8 28	8 11	5 15	6 11	5 40	7 1	2 32	9 8	2 59	10 10				
F.	25	10 39	8 54	9 2	9 16	9 5	6 4	7 6	6 27	7 9	3 23	10 7	3 43	11 10				
S.	26	11 31	9 38	9 7	10 0	9 9	6 50	7 11	7 13	11 1	4 4	11 4	4 26	11 10				
S.	27	morn.	10 20	9 10	10 40	9 10	7 34	8 2	7 54	8 3	4 48	11 10	5 9	12 10				
M.	28	0 22	11 0	9 10	11 19	9 9	8 13	8 3	8 32	8 2	5 30	12 0	5 49	11 10				
Tu.	29	1 14	11 38	9 8	11 58	9 7	8 50	8 1	9 8	7 10	6 8	11 9	6 28	11 10				
W.	30	2 5	—	—	0 18	9 6	9 26	7 7	9 43	7 4	6 47	11 2	7 6	10 10				
Half Mean Spring } Range.			4 ft. 9 in.				3 ft. 10 in.				5 ft. 7 in.							
Phases of the Moon.							Moon's Declination at Noon.											
D. H. M.							M.D.		° ' "		M.D.		° ' "		M.D.		° ' "	
Last Quarter - 5 1 9 Morning.							1		13 N. 1		9		14 N. 40		17		17 S. 40	
New - - - - - 13 4 42 Morning.							2		16 35		10		11 9		18		19 59	
First Quarter - 20 1 33 Afternoon.							3		19 14		11		7 8		19		21 12	
Full - - - - - 27 6 2 Morning.							4		20 52		12		2 47		20		21 9	
							5		21 28		13		18 44		21		19 46	
							6		21 5		14		6 15		22		17 8	
In Apogee - - 8 11 0 Morning.							7		19 45		15		10 33		23		13 25	
In Perigee - - 24 8 0 Morning.							8		17 35		16		14 27		24		8 52	

The times for High Water are given for Mean Time at Place; if Dublin or Railway Time be required, —

BELFAST subtract 3 m.

LONDONDERRY add 4 m.

SLIGO BAY add 6 m.

SEPTEMBER, 1863.

MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.								
1	6 36 15 3	6 56 14 10	7 2 12 1	7 21 11 9	7 23 12 11	7 41 12 8	17.9																		
2	7 15 14 3	7 35 13 9	7 39 11 5	7 57 11 0	7 59 12 4	8 17 12 0	18.9																		
3	7 56 13 1	8 18 12 4	8 16 10 8	8 34 10 2	8 35 11 7	8 51 11 2	19.9																		
4	8 42 11 8	9 8 11 0	8 55 9 9	9 18 9 4	9 9 10 9	9 32 10 4	20.9																		
5	9 37 10 6	10 12 10 1	9 41 9 0	10 12 8 8	9 59 9 11	10 35 9 7	21.9																		
6	10 53 9 10	11 36 9 10	10 52 8 6	11 33 8 5	11 12 9 3	11 50 9 2	22.9																		
7	— — — —	0 18 10 0	— — — —	0 16 8 6	— — — —	0 29 9 3	23.9																		
8	0 55 10 3	1 30 10 7	0 56 8 8	1 35 8 11	1 7 9 4	1 44 9 7	24.9																		
9	2 1 11 0	2 23 11 6	2 10 9 2	2 38 9 5	2 20 9 11	2 49 10 3	25.9																		
10	2 44 12 0	3 4 12 5	3 1 9 9	3 22 10 2	3 15 10 7	3 38 10 11	26.9																		
11	3 23 12 10	3 39 13 3	3 42 10 6	4 0 10 9	4 0 11 3	4 20 11 6	27.9																		
12	3 55 13 8	4 11 14 0	4 17 10 11	4 34 11 3	4 39 11 9	4 57 11 11	28.9																		
13	4 27 14 4	4 42 14 7	4 51 11 5	5 8 11 8	5 14 12 1	5 29 12 3	29.9																		
14	4 57 14 9	5 14 14 10	5 24 11 9	5 42 11 9	5 44 12 4	6 1 12 5	30.9																		
15	5 31 14 11	5 48 14 10	5 58 11 10	6 15 11 9	6 19 12 6	6 36 12 6	31.9																		
16	6 6 14 8	6 24 14 6	6 32 11 9	6 50 11 7	6 53 12 5	7 11 12 4	32.9																		
17	6 42 14 3	7 1 14 0	7 8 11 5	7 26 11 3	7 28 12 3	7 45 12 1	33.9																		
18	7 22 13 7	7 44 13 2	7 45 11 0	8 4 10 8	8 3 11 11	8 22 11 8	34.9																		
19	8 8 12 8	8 35 12 1	8 24 10 4	8 48 10 0	8 42 11 4	9 3 11 1	35.9																		
20	9 6 11 7	9 41 11 2	9 16 9 9	9 45 9 6	9 30 10 9	10 4 10 5	36.9																		
21	10 22 11 0	11 8 11 1	10 22 9 4	11 6 9 3	10 44 10 2	11 26 10 0	37.9																		
22	11 54 11 3	— — — —	11 52 9 4	— — — —	— — — —	0 6 10 1	38.9																		
23	0 35 11 8	1 12 12 2	0 35 9 7	1 17 9 11	0 46 10 4	1 25 10 8	39.9																		
24	1 43 12 9	2 11 13 5	1 54 10 3	2 27 10 8	2 4 11 1	2 40 11 6	40.9																		
25	2 39 13 11	3 3 14 6	2 57 11 1	3 22 11 6	3 12 11 11	3 40 12 3	41.9																		
26	3 25 14 11	3 46 15 4	3 46 11 10	4 9 12 2	4 6 12 7	4 31 12 10	42.9																		
27	4 8 15 7	4 28 15 10	4 31 12 4	4 52 12 5	4 54 13 0	5 15 13 1	43.9																		
28	4 47 15 11	5 8 15 10	5 14 12 6	5 36 12 5	5 35 13 1	5 56 13 1	44.9																		
29	5 29 15 8	5 49 15 4	5 56 12 4	6 15 12 2	6 16 13 0	6 36 12 10	45.9																		
30	6 8 14 11	6 27 14 6	6 34 11 11	6 53 11 7	6 56 12 8	7 15 12 5	46.9																		

Mean Spring } 7ft. 5in.
Range.

5ft. 10in.

6ft. 2in.

Equation of Time at Noon.

M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
0 2		9	2 39		17	5 26		25	8 14	
0 21		10	3 0		18	5 47		26	8 34	
0 40		11	3 20		19	6 8		27	8 55	
0 59		12	3 41		20	6 29		28	9 15	
1 19		13	4 2		21	6 50		29	9 35	
1 39		14	4 23		22	7 11		30	9 54	
1 59		15	4 44		23	7 32				
2 19		16	5 5		24	7 53				

Times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

OCTOBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.								
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.											
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.											
Th.	1	2m57	5 52	18 2	6 11	17 6	7 47	15 0	8 4	14 6	1 35	12 6	1 53	13 3																	
F.	2	3 48	6 31	16 8	6 52	15 10	8 21	14 11	8 37	13 6	2 12	11 11	2 32	11 6																	
S.	3	4 39	7 14	15 0	7 37	14 2	8 55	13 5	9 12	12 6	2 53	11 2	3 13	10 10																	
S.	4	5 28	8 1	13 6	8 29	12 11	9 34	12 6	9 59	11 7	3 35	10 5	3 58	10 1																	
M.	5	6 16	9 4	12 7	9 43	12 5	10 28	11 10	11 0	11 0	4 25	9 9	4 58	9 6																	
Tu.	6	7 2	10 29	12 5	11 11	12 8	11 40	11 8	—	—	5 35	9 4	6 18	9 4																	
W.	7	7 46	11 50	13 1	—	—	0 22	11 1	1 3	12 1	7 0	9 6	7 37	9 9																	
Th.	8	8 30	0 23	13 8	0 52	14 3	1 42	11 9	2 17	12 9	8 11	10 1	8 42	10 6																	
F.	9	9 13	1 16	14 11	1 36	15 8	2 45	12 7	3 13	13 7	9 7	10 10	9 28	11 1																	
S.	10	9 57	1 55	16 5	2 12	17 1	3 37	13 6	4 1	14 5	9 49	11 6	10 7	11 5																	
S.	11	10 41	2 29	17 9	2 46	18 3	4 21	14 3	4 41	15 0	10 25	12 1	10 42	12 1																	
M.	12	11 27	3 4	18 9	3 21	19 1	5 0	15 0	5 18	15 5	11 0	12 5	11 17	12 1																	
Tu.	13	0 16	3 39	19 3	3 56	19 5	5 35	15 4	5 53	15 7	11 35	12 9	11 51	12 11																	
W.	14	1 8	4 14	19 6	4 32	19 5	6 11	15 7	6 30	15 7	—	—	0 11	12 11																	
Th.	15	2 3	4 51	19 4	5 9	19 1	6 47	15 6	7 5	15 3	0 31	12 9	0 51	12 1																	
F.	16	2 59	5 28	18 9	5 50	18 4	7 23	15 3	7 42	14 11	1 10	12 7	1 30	12 6																	
S.	17	3 57	6 12	17 10	6 34	17 3	8 4	14 11	8 25	14 4	1 51	12 4	2 13	12 1																	
S.	18	4 55	7 0	16 7	7 29	15 10	8 45	14 5	9 10	13 7	2 35	11 10	3 0	11 1																	
M.	19	5 52	7 59	15 11	8 31	14 8	9 38	13 9	10 8	12 10	3 27	11 3	3 56	10 1																	
Tu.	20	6 47	9 9	14 5	9 50	14 5	10 41	13 3	11 20	12 5	4 27	10 8	5 3	10 1																	
W.	21	7 40	10 38	14 7	11 20	15 0	—	—	0 5	13 2	5 42	10 4	6 27	10 1																	
Th.	22	8 31	11 59	15 6	—	—	0 50	12 8	1 32	13 8	7 8	10 8	7 46	11 1																	
F.	23	9 21	0 30	16 1	1 0	16 9	2 8	13 4	2 40	14 5	8 20	11 4	8 51	11 1																	
S.	24	10 12	1 25	17 6	1 49	18 2	3 11	14 4	3 38	15 2	9 19	12 1	9 44	12 1																	
S.	25	11 2	2 11	18 8	2 32	19 3	4 3	15 1	4 27	15 7	10 6	12 7	10 28	12 1																	
M.	26	11 53	2 53	19 7	3 13	19 8	4 51	15 6	5 11	15 10	10 49	12 10	11 10	13 1																	
Tu.	27	morn.	2 33	19 7	3 55	19 6	5 32	15 9	5 52	15 9	11 29	12 11	11 51	13 1																	
W.	28	0 45	4 15	19 4	4 34	19 1	6 12	15 11	6 30	15 6	—	—	0 12	13 1																	
Th.	29	1 37	4 52	18 8	5 10	18 3	6 47	15 5	7 4	14 11	0 33	12 7	0 52	13 1																	
F.	30	2 29	5 28	17 10	5 47	17 3	7 20	14 11	7 36	14 3	1 11	12 3	1 30	12 1																	
S.	31	3 19	6 7	16 8	6 25	16 1	7 54	14 3	8 11	13 5	1 48	11 9	2 8	11 1																	
Half Mean Spring Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.												
Phases of the Moon.																Moon's Declination at Noon.															
D. H. ■																M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'				
Last Quarter - 4 7 21 Afternoon.																1	20N.	10	9	4N.	7	17	21S.	5	25	9N.2					
New - - - - 12 6 42 Afternoon.																2	21	■	10	0S.	20	18	20	0	26	13 3					
First Quarter - 19 8 6 Afternoon.																3	21	5	11	4	52	19	17	40	27	17					
Full - - - - 26 5 55 Afternoon.																4	20	3	12	9	17	■	14	17	28	19 2					
																5	18	8	13	13	20	21	10	3	29	20 4					
																6	15	28	14	16	47	22	5	17	30	21					
In Apogee - - 6 5 0 Morning.																7	12	10	15	19	22	23	0	14	31	20 2					
In Perigee - - 20 9 0 Afternoon.																■	8	20	16	20	51	24	4N.	47							

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
 Brest add 18 m. | Devonport add 17 m. | Portsmouth add 6 m.

OCTOBER, 1863.

DOVER.					SHEERNESS.					LONDON.					C's AGE AT NOON.
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			
Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.		
1 13 18 7		1 32 18 2			2 46 16 2		3 3 15 10			4 18 19 5		4 35 19 1		18.3	
1 52 18 0		2 13 17 10			3 21 15 6		3 40 15 1			4 53 18 8		5 13 18 3		19.3	
2 34 17 7		2 54 15 9			4 1 14 7		4 23 14 1			5 31 17 9		5 53 17 3		20.3	
3 16 15 2		3 39 14 7			4 45 13 8		5 9 13 3			6 15 16 9		6 39 16 3		(
4 4 14 0		4 34 13 7			5 35 12 11		6 6 12 7			7 6 15 11		7 37 15 6		22.3	
5 8 13 4		5 48 13 4			6 43 12 4		7 24 12 4			8 13 15 3		8 54 15 1		23.3	
6 26 13 6		7 3 13 11			8 10 12 5		8 51 12 8			9 34 15 0		10 14 15 2		24.3	
7 37 14 6		8 7 15 0			9 28 13 0		10 0 13 4			10 54 15 5		11 28 15 8		25.3	
8 31 15 6		8 51 16 1			10 28 13 8		10 50 14 1			11 58 16 1		—		26.3	
9 12 16 7		9 31 17 1			11 10 14 6		11 28 14 10			0 20 16 6		0 39 16 11		27.3	
9 50 17 7		10 9 17 11			11 45 15 2		—			0 56 17 4		1 15 17 9		28.3	
10 28 18 4		10 47 18 7			0 2 15 6		0 19 15 9			1 33 18 1		1 51 18 5		●	
11 7 18 9		11 25 18 11			0 37 15 11		0 54 16 2			2 7 18 9		2 24 19 0		0.7	
11 45 19 0		—			1 11 16 3		1 28 16 4			2 40 19 2		2 57 19 4		1.7	
0 5 19 0		0 26 18 11			1 46 16 4		2 3 16 3			3 16 19 5		3 33 19 5		2.7	
0 47 18 9		1 9 18 6			2 22 16 2		2 39 16 1			3 51 19 4		4 10 19 3		3.7	
1 31 18 3		1 53 17 11			2 58 15 10		3 20 15 7			4 30 19 0		4 51 18 9		4.7	
2 17 17 6		2 41 17 0			3 42 15 3		4 5 14 11			5 14 18 6		5 36 18 1		5.7	
3 8 16 6		3 37 16 0			4 30 14 6		4 59 14 2			6 2 17 9		6 31 17 4)	
4 6 15 6		4 39 15 1			5 32 13 10		6 7 13 7			7 2 16 11		7 38 16 8		7.7	
5 14 15 0		5 55 15 1			6 48 13 4		7 32 13 5			8 18 16 5		9 3 16 4		8.7	
6 34 15 5		7 12 15 11			8 19 13 8		8 59 14 0			9 46 16 5		10 25 16 7		9.7	
7 45 16 6		8 15 17 1			9 36 14 4		10 6 14 9			11 4 16 10		11 35 17 3		10.7	
8 42 17 7		9 7 18 0			10 34 15 2		10 59 15 6			—		0 2 17 8		11.7	
9 31 18 5		9 55 18 9			11 22 15 9		11 44 16 1			0 27 18 1		0 52 18 5		12.7	
10 17 19 0		10 39 19 1			—		0 5 16 3			1 15 18 9		1 38 19 0		○	
11 2 19 1		11 24 19 0			0 26 16 5		0 46 16 6			1 58 19 3		2 19 19 4		14.7	
11 46 18 10		—			1 6 16 6		1 27 16 5			2 38 19 5		2 57 19 5		15.7	
0 7 18 8		0 27 18 5			1 46 16 3		2 5 16 1			3 15 19 4		3 34 19 2		16.7	
0 48 18 1		1 8 17 10			2 23 15 10		2 40 15 7			3 52 19 0		4 11 18 9		17.7	
1 28 17 5		1 48 17 0			2 58 15 4		3 17 15 0			4 29 18 5		4 46 18 1		18.7	
Mean Spring } 9ft. 4in. Range.					8ft. 0in.					9ft. 7in.					

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
10 14		9	12 36		17	14 30		25	15 46	
10 33		10	12 52		18	14 42		26	15 53	
10 52		11	13 8		19	14 53		27	15 59	
11 10		12	13 23		20	15 3		28	16 4	
11 28		13	13 37		21	15 13		29	16 8	
11 46		14	13 51		22	15 22		30	16 12	
12 3		15	14 5		23	15 31		31	16 15	
12 20		16	14 17		24	15 39				

as of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

OCTOBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRAVEL.	HARWICH.				HULL.				SUNDERLAND.														
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.												
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.											
Th.	1	2m 57	2 2 11 6	2 21 11 3	8 38 20 7	8 57 20 0	5 29 14 0	5 48 14 0	5 29 14 0	5 48 14 0	5 29 14 0	5 48 14 0													
F.	2	3 48	2 40 11 0	2 59 10 9	9 17 19 4	9 37 18 7	6 8 13 1	6 30 13 1	9 37 18 7	6 8 13 1	6 30 13 1	6 30 13 1													
S.	3	4 39	3 19 10 6	3 39 10 3	9 58 17 11	10 20 17 4	6 54 12 2	7 16 12 2	10 20 17 4	6 54 12 2	7 16 12 2	7 16 12 2													
S.	4	5 28	3 59 9 11	4 22 9 9	10 48 16 8	11 17 16 1	7 41 11 3	8 7 11 3	11 17 16 1	7 41 11 3	8 7 11 3	8 7 11 3													
M.	5	6 16	4 47 9 6	5 15 9 4	11 51 15 7	—	8 37 10 6	9 13 10 6	—	—	8 37 10 6	9 13 10 6													
Tu.	6	7 2	5 50 9 3	6 31 9 2	0 28 15 3	1 4 15 1	9 54 10 1	10 37 10 1	1 4 15 1	9 54 10 1	10 37 10 1	10 37 10 1													
W.	7	7 46	7 18 9 3	7 59 9 5	1 45 15 2	2 23 15 6	11 16 10 4	11 49 10 4	2 23 15 6	11 16 10 4	11 49 10 4	11 49 10 4													
Th.	8	8 30	8 35 9 7	9 7 9 10	2 57 16 0	3 28 16 8	—	0 19 16 8	3 28 16 8	—	—	0 19 16 8													
F.	9	9 13	9 35 10 1	9 59 10 4	3 57 17 3	4 19 17 10	0 47 11 6	1 9 11 6	4 19 17 10	0 47 11 6	1 9 11 6	1 9 11 6													
S.	10	9 57	10 20 10 7	10 39 10 10	4 39 18 5	4 56 19 0	1 29 12 5	1 50 12 5	4 56 19 0	1 29 12 5	1 50 12 5	1 50 12 5													
S.	11	10 41	10 56 11 1	11 15 11 3	5 13 19 6	5 30 19 10	2 9 13 2	2 27 13 2	5 30 19 10	2 9 13 2	2 27 13 2	2 27 13 2													
M.	12	11 27	11 32 11 5	11 50 11 7	5 48 20 3	6 7 20 7	2 44 13 9	3 0 13 9	6 7 20 7	2 44 13 9	3 0 13 9	3 0 13 9													
Tu.	13	0 16	—	0 7 11 8	6 24 20 10	6 42 21 0	3 17 14 3	3 35 14 3	6 42 21 0	3 17 14 3	3 35 14 3	3 35 14 3													
W.	14	1 8	0 24 11 8	0 40 11 9	6 58 21 2	7 17 21 3	3 51 14 7	4 8 14 7	7 17 21 3	3 51 14 7	4 8 14 7	4 8 14 7													
Th.	15	2 3	0 59 11 8	1 18 11 7	7 37 21 2	7 55 21 2	4 26 14 8	4 45 14 8	7 55 21 2	4 26 14 8	4 45 14 8	4 45 14 8													
F.	16	2 59	1 37 11 6	1 56 11 5	8 14 20 11	8 33 20 7	5 4 14 3	5 24 14 3	8 33 20 7	5 4 14 3	5 24 14 3	5 24 14 3													
S.	17	3 57	2 16 11 3	2 38 11 1	8 56 20 1	9 18 19 8	5 47 13 8	6 10 13 8	9 18 19 8	5 47 13 8	6 10 13 8	6 10 13 8													
S.	18	4 55	3 0 10 11	3 22 10 9	9 40 19 1	10 6 18 7	6 35 13 0	7 2 13 0	10 6 18 7	6 35 13 0	7 2 13 0	7 2 13 0													
M.	19	5 52	3 46 10 6	4 13 10 4	10 38 18 1	11 13 17 7	7 31 12 3	8 4 12 3	11 13 17 7	7 31 12 3	8 4 12 3	8 4 12 3													
Tu.	20	6 47	4 45 10 1	5 17 10 0	11 52 17 2	—	8 39 11 7	9 19 11 7	—	—	8 39 11 7	9 19 11 7													
W.	21	7 40	5 55 9 11	6 39 9 11	0 32 16 10	1 12 16 10	10 1 11 5	10 45 11 5	1 12 16 10	10 1 11 5	10 45 11 5	10 45 11 5													
Th.	22	8 31	7 27 10 1	8 7 10 3	1 52 17 1	2 29 17 7	11 23 11 10	11 56 11 10	2 29 17 7	11 23 11 10	11 56 11 10	11 56 11 10													
F.	23	9 21	8 43 10 6	9 13 10 9	3 4 18 3	3 35 18 10	—	0 25 18 10	3 35 18 10	—	—	0 25 18 10													
S.	24	10 12	9 43 11 1	10 10 11 3	4 3 19 6	4 28 20 0	0 53 13 1	1 20 13 1	4 28 20 0	0 53 13 1	1 20 13 1	1 20 13 1													
S.	25	11 2	10 33 11 6	10 55 11 8	4 50 20 6	5 12 20 10	1 45 13 10	2 8 13 10	5 12 20 10	1 45 13 10	2 8 13 10	2 8 13 10													
M.	26	11 53	11 18 11 10	11 39 11 11	5 34 21 1	5 56 21 3	2 30 14 5	2 51 14 5	5 56 21 3	2 30 14 5	2 51 14 5	2 51 14 5													
Tu.	27	morn.	12 0 11 11	—	6 17 21 4	6 37 21 4	3 10 14 8	3 29 14 8	—	—	3 10 14 8	3 29 14 8													
W.	28	0 45	0 19 11 10	0 39 11 9	6 58 21 3	7 19 21 1	3 50 14 8	4 9 14 8	7 19 21 1	3 50 14 8	4 9 14 8	4 9 14 8													
Th.	29	1 37	1 0 11 8	1 20 11 6	7 39 20 10	7 56 20 7	4 28 14 5	4 46 14 5	7 56 20 7	4 28 14 5	4 46 14 5	4 46 14 5													
F.	30	2 29	1 38 11 4	1 57 11 1	8 15 20 2	8 33 19 9	5 5 13 9	5 24 13 9	8 33 19 9	5 5 13 9	5 24 13 9	5 24 13 9													
S.	31	3 19	2 16 10 11	2 35 10 8	8 53 19 2	9 13 18 7	5 44 13 0	6 5 13 0	9 13 18 7	5 44 13 0	6 5 13 0	6 5 13 0													
Half Mean Spring Range.			5 ft. 9 in.				10 ft. 5 in.				7 ft. 2 in.														
Phases of the Moon.													Moon's Declination at Noon.												
D. H. M.													M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	
Last Quarter - 4 7 21 Afternoon.													1	20	N. 10	9	4	N. 7	17	21	S. 5	25	9		
New - - - - 12 6 42 Afternoon.													2	21	8	10	0	8.20	18	20	0	26	13		
First Quarter 19 8 6 Afternoon.													3	21	5	11	4	52	19	17	40	27	17		
Full - - - - 26 5 55 Afternoon.													4	20	3	12	9	17	20	14	17	28	19		
													5	18	8	13	13	20	21	10	3	29	20		
In Apogee - - 6 5 0 Morning.													6	15	28	14	16	47	22	5	17	30	21		
In Perigee - - 20 9 0 Afternoon.													7	12	10	15	19	22	23	0	14	31	20		
													8	■	20	16	20	51	24	4	N. 47				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

OCTOBER, 1863.

NORTH SHIELDS.						LEITH,						THURSO.						C'S AGE AT NOON.
MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			
Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.		
5 33	12	10	5 52	12	5	4 27	15	10	4 46	15	5	10 37	12	4	10 58	11	9	18.3
6 12	12	0	6 33	11	7	5 6	14	11	5 28	14	5	11 20	11	3	11 44	10	9	19.3
6 55	11	1	7 19	10	7	5 52	13	11	6 15	13	4	—	—	—	0 7	10	2	20.3
7 46	10	1	8 14	9	7	6 40	12	10	7 9	12	4	0 32	9	8	0 59	9	3	(
8 47	9	3	9 26	9	1	7 41	12	0	8 18	11	9	1 32	8	11	2 10	8	8	22.3
10 6	9	1	10 49	9	2	9 0	11	7	9 44	11	8	2 53	8	6	3 42	8	7	23.3
11 29	9	5	—	—	—	10 22	11	11	10 56	12	2	4 22	8	8	4 58	8	10	24.3
0 3	9	8	0 33	10	0	11 26	12	7	11 54	13	0	5 28	9	3	5 55	9	8	25.3
0 59	10	5	1 20	10	9	—	—	—	0 14	13	5	6 16	10	2	6 33	10	9	26.3
1 38	11	2	1 56	11	7	0 32	13	11	0 50	14	5	6 48	11	3	7 3	11	10	27.3
2 12	12	0	2 29	12	4	1 7	14	11	1 25	15	4	7 18	12	3	7 32	12	8	28.3
2 45	12	8	3 1	12	11	1 42	15	9	1 59	16	1	7 47	13	1	8 4	13	4	●
3 17	13	2	3 35	13	4	2 16	16	4	2 33	16	6	8 21	13	5	8 36	13	6	0.7
3 51	13	6	4 9	13	6	2 48	16	7	3 5	16	7	8 54	13	6	9 13	13	5	1.7
4 28	13	4	4 47	13	2	3 24	16	5	3 43	16	3	9 33	13	3	9 52	13	1	2.7
5 7	13	0	5 28	12	9	4 2	16	1	4 23	15	10	10 13	12	9	10 36	12	5	3.7
5 50	12	6	6 13	12	3	4 45	15	6	5 8	15	2	11 0	12	0	11 25	11	8	4.7
6 37	11	11	7 3	11	7	5 33	14	10	6 0	14	5	11 51	11	3	—	—	—	5.7
7 35	11	1	8 10	10	8	6 30	13	11	7 5	13	6	0 22	10	9	0 56	10	5)
8 48	10	5	9 31	10	3	7 42	13	2	8 23	13	0	1 33	10	2	2 15	9	11	7.7
10 14	10	4	10 57	10	7	9 7	13	0	9 52	13	2	3 2	9	11	3 50	10	0	8.7
11 36	10	11	—	—	—	10 29	13	6	11 3	13	10	4 30	10	3	5 5	10	6	9.7
0 10	11	3	0 37	11	7	11 32	14	3	11 58	14	9	5 33	10	11	6 0	11	6	10.7
1 4	11	11	1 27	12	4	—	—	—	0 21	15	3	6 22	12	0	6 42	12	6	11.7
1 50	12	8	2 11	13	0	0 44	15	8	1 6	16	1	7 1	12	11	7 19	13	4	12.7
2 31	13	3	2 51	13	5	1 28	16	5	1 49	16	7	7 38	13	7	7 57	13	9	○
3 10	13	7	3 30	13	7	2 9	16	9	2 28	16	9	8 16	13	8	8 35	13	7	14.7
3 50	13	6	4 10	13	4	2 47	16	7	3 6	16	5	8 54	13	5	9 14	13	2	15.7
4 30	13	1	4 49	12	10	3 26	16	2	3 44	15	10	9 34	12	10	9 53	12	6	16.7
5 8	12	6	5 28	12	3	4 3	15	6	4 22	15	2	10 13	12	2	10 33	11	8	17.7
5 48	11	11	6 8	11	6	4 42	14	10	5 3	14	5	10 54	11	3	11 15	10	10	18.7
If Mean Spring } 6ft. 8in.						8ft. 2in.						6ft. 7in.						
Range.																		

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
10 14		9	12 36		17	14 30		25	15 46	
10 33		10	12 52		18	14 42		26	15 53	
10 52		11	13 8		19	14 53		27	15 59	
11 10		12	13 23		20	15 3		28	16 4	
11 28		13	13 37		21	15 13		29	16 8	
11 46		14	13 51		22	15 22		30	16 12	
12 3		15	14 5		23	15 31		31	16 15	
12 20		16	14 17		24	15 39				

Times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

OCTOBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSHIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
Th.	1	2m57	2 0	9 9	2 18	9 7	1 11	25 7	1 29	24 10	8 20	20 1	8 39	19 4	
F.	2	3 48	2 37	9 4	2 56	9 2	1 47	24 0	2 7	23 2	8 58	18 7	9 17	17 10	
S.	3	4 39	3 16	8 11	3 36	8 9	2 26	22 4	2 47	21 6	9 37	17 1	9 57	16 4	
♄.	4	5 28	3 59	■ 6	4 22	8 4	3 10	20 7	3 35	19 10	10 17	15 7	10 40	14 11	
M.	5	6 16	4 50	8 2	5 24	8 0	4 5	19 2	4 42	18 8	11 10	14 5	11 44	14 2	
Tu.	6	7 2	6 1	7 10	6 44	7 9	5 24	18 6	6 14	18 8	—	—	0 25	14 2	
W.	7	7 46	7 25	7 10	8 2	8 0	6 54	19 0	7 31	19 6	1 9	14 4	1 50	14 9	
Th.	8	8 30	8 35	8 2	9 4	8 5	8 3	20 3	8 31	21 0	2 26	15 5	2 58	16 1	
F.	9	9 13	9 29	8 7	9 50	8 9	8 53	21 9	9 12	22 6	3 24	16 10	3 47	17 7	
S.	10	9 57	10 10	8 11	10 28	9 1	9 30	23 3	9 47	23 11	4 9	18 3	4 30	18 11	
♄.	11	10 41	10 47	9 3	11 6	9 4	10 3	24 6	10 20	25 0	4 50	19 6	5 10	20 0	
M.	12	11 27	11 25	9 6	11 43	9 7	10 38	25 5	10 56	25 10	5 30	20 5	5 48	20 10	
Tu.	13	02 16	—	—	0 2	9 9	11 15	26 1	11 31	26 4	6 6	21 1	6 22	21 4	
W.	14	1 8	0 19	9 10	0 38	9 10	11 49	26 5	—	—	6 40	21 5	6 59	21 5	
Th.	15	2 3	0 58	9 10	1 17	9 10	0 8	26 5	0 28	26 3	7 17	21 3	7 36	21 0	
F.	16	2 59	1 36	9 9	1 55	9 9	0 47	26 0	1 6	25 7	7 56	20 8	8 18	20 3	
S.	17	3 57	2 17	9 8	2 38	9 6	1 26	25 0	1 48	24 5	8 39	19 9	9 1	19 2	
♄.	18	4 55	2 59	9 4	3 23	9 2	2 10	23 10	2 33	23 2	9 24	18 7	9 49	18 0	
M.	19	5 52	3 51	9 0	4 21	8 10	3 2	22 6	3 32	21 9	10 16	17 4	10 43	16 9	
Tu.	20	6 47	4 52	8 8	5 29	8 6	4 7	21 2	4 47	20 9	11 15	16 3	11 51	16 2	
W.	21	7 40	6 8	8 5	6 53	8 5	5 32	20 9	6 22	21 1	—	—	0 34	16 4	
Th.	22	8 31	7 33	8 7	8 11	8 9	7 3	21 8	7 39	22 4	1 19	16 8	2 1	17 3	
F.	23	9 21	8 42	9 0	9 13	9 2	8 9	23 1	8 37	23 10	2 36	17 11	3 8	18 9	
S.	24	10 12	9 40	9 4	10 4	9 6	9 1	24 7	9 23	25 2	3 38	19 5	4 4	20 0	
♄.	25	11 2	10 28	9 7	10 52	9 8	9 45	25 ■	10 6	26 1	4 30	20 7	4 56	21 0	
M.	26	11 53	11 14	9 9	11 36	9 10	10 27	26 4	10 48	26 6	5 19	21 3	5 40	21 5	
Tu.	27	morn.	11 57	9 10	—	—	11 9	26 6	11 30	26 5	6 1	21 5	6 21	21 5	
W.	28	0 45	0 18	9 10	0 39	9 10	11 50	26 3	—	—	6 41	21 3	7 1	21 0	
Th.	29	1 37	1 0	9 9	1 18	9 8	0 10	26 0	0 29	25 7	7 19	20 7	7 37	20 2	
F.	30	2 29	1 36	9 7	1 55	9 5	0 47	25 1	1 6	24 7	7 56	19 9	8 15	19 2	
S.	31	3 19	2 14	9 3	2 32	9 1	1 24	23 10	1 43	23 2	8 34	18 7	8 52	18 0	
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter - 4 7 21 Afternoon.							1	20	N. 10	9	4	N. 7	17	31	8. 5
New - - - - 12 6 42 Afternoon.							2	21	8	10	0	8. 20	18	20	0
First Quarter 19 8 6 Afternoon.							3	21	5	11	4	52	19	17	40
Full - - - - 26 5 55 Afternoon.							4	20	3	12	9	17	20	14	17
							5	18	8	13	13	20	21	10	3
In Apogee - - 6 5 0 Morning.							6	15	28	14	16	47	22	5	17
In Perigee - - 20 9 0 Afternoon.							7	12	10	15	19	22	23	0	14
							8	8	20	16	20	51	24	4	N. 47

*The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 Greenock add 19 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

OCTOBER, 1863.

WESTON-SUPER-MARE.										HOLYHEAD.										KINGSTOWN.										C's Age at Noon.
MORNING.					AFTERNOON.					MORNING.					AFTERNOON.					MORNING.					AFTERNOON.					
Time. H. M. F. I.	Height.				Time. H. M. F. I.	Height.				Time. H. M. F. I.	Height.				Time. H. M. F. I.	Height.				Time. H. M. F. I.	Height.				Time. H. M. F. I.	Height.				
1	8	59	36	2	9	16	35	0	—	—	0	19	15	3	1	2	10	8	1	21	10	5	18.3							
2	9	33	33	9	9	50	32	7	0	40	14	9	1	2	14	3	1	41	10	1	2	2	9	10	19.3					
3	10	6	31	3	10	24	31	0	1	25	13	9	1	48	13	3	2	25	9	7	2	47	9	3	20.3					
4	10	44	28	9	11	10	27	8	2	13	12	9	2	40	12	4	3	12	9	0	3	39	8	9	(
5	11	44	26	11	—	—	—	—	3	13	12	0	3	51	11	9	4	11	8	6	4	47	8	4	22.3					
6	0	20	26	5	1	4	26	6	4	33	11	8	5	17	11	9	5	24	8	4	6	6	8	5	23.3					
7	1	46	26	10	2	24	27	5	5	56	12	0	6	30	12	3	6	43	8	7	7	17	8	9	24.3					
8	2	59	28	4	3	32	29	4	7	0	12	8	7	27	13	1	7	48	9	0	8	17	9	3	25.3					
9	4	1	30	5	4	25	31	7	7	49	13	6	8	8	13	11	8	41	9	6	9	2	9	9	26.3					
0	4	49	32	8	5	11	33	10	8	26	14	4	8	42	14	9	9	23	9	11	9	41	10	2	27.3					
1	5	31	34	9	5	51	35	7	8	58	15	2	9	15	15	5	9	58	10	5	10	13	10	7	28.3					
2	6	11	36	3	6	30	36	10	9	32	15	9	9	49	15	11	10	29	10	9	10	45	10	11	●					
3	6	48	37	3	7	6	37	9	10	6	16	1	10	20	16	3	11	2	11	0	11	18	11	1	0.7					
4	7	24	37	11	7	42	37	10	10	37	16	3	10	54	16	2	11	37	11	1	11	57	11	0	1.7					
5	8	0	37	9	8	18	37	5	11	13	16	1	11	33	15	11	—	—	—	—	0	17	10	11	2.7					
6	8	37	37	0	8	57	36	5	11	54	15	8	—	—	—	0	36	10	10	0	57	10	8	3.7						
7	9	17	35	8	9	36	34	9	0	17	15	5	0	42	15	0	1	19	10	6	1	42	10	3	4.7					
8	9	55	33	9	10	18	32	8	1	7	14	8	1	33	14	3	2	7	10	1	2	33	9	10	5.7					
9	10	44	31	7	11	13	30	7	2	3	13	10	2	37	13	6	3	2	9	7	3	35	9	5	6.7					
0	11	48	29	11	—	—	—	—	3	14	13	2	3	56	13	0	4	12	9	2	4	51	9	1	7.7					
1	0	27	29	9	1	13	30	0	4	40	13	1	5	25	13	3	5	31	9	1	6	13	9	3	8.7					
2	1	54	30	6	2	33	31	4	6	3	13	7	6	37	13	11	6	50	9	5	7	24	9	8	9.7					
3	3	10	32	4	3	45	33	5	7	5	14	4	7	33	14	9	7	55	9	11	8	25	10	2	10.7					
4	4	16	34	7	4	45	35	7	7	57	15	2	8	20	15	6	8	53	10	5	9	18	10	7	11.7					
5	5	11	36	5	5	37	37	2	8	40	15	10	9	1	16	1	9	40	10	9	10	0	10	11	12.7					
6	6	0	37	7	6	22	37	9	9	22	16	3	9	42	16	4	10	19	11	1	10	38	11	2	13.7					
7	6	44	37	10	7	5	37	11	10	1	16	4	10	19	16	3	10	58	11	2	11	18	11	1	14.7					
8	7	25	37	8	7	44	37	3	10	37	16	2	10	56	15	11	11	38	11	0	11	59	10	11	15.7					
9	8	2	36	9	8	19	36	2	11	15	15	8	11	34	15	5	—	—	—	0	18	10	9	16.7						
0	8	37	35	6	8	54	34	8	11	54	15	1	—	—	—	0	37	10	6	0	57	10	4	17.7						
1	9	11	33	9	9	27	32	10	0	15	14	8	0	36	14	3	1	17	10	1	1	37	9	10	18.7					
Mean Spring } Range. } 18ft. 7in.										8ft. 0in.										5ft. 6in.										

Equation of Time at Noon.

M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
10 14		9	12 36		17	14 30		25	15 46	
10 33		10	12 52		18	14 42		26	15 53	
10 52		11	13 8		19	14 53		27	15 59	
11 10		12	13 23		20	15 3		28	16 4	
11 28		13	13 37		21	15 13		29	16 8	
11 46		14	13 51		22	15 22		30	16 12	
12 3		15	14 5		23	15 31		31	16 15	
12 20		16	14 17		24	15 39				

use of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 12 m. | KINGSTOWN subtract 1 m. for Dublin Time.

OCTOBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.						LONDONDERRY.						SLIGO BAY.					
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.		
			Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.	
		H. M.	H. M.	P. I.	H. M.	P. I.		H. M.	P. I.		H. M.	P. I.		H. M.	P. I.		H. M.	P. I.		
Th.	1	2m57	0 38	9 4	0 57	9 3	10 0	7 1	10 19	6 10	7 24	10 4	7 43	9 1						
F.	2	3 48	1 19	9 1	1 42	8 10	10 40	6 6	11 7	6 2	8 3	9 6	8 26	9						
S.	3	4 39	2 6	8 8	2 30	8 5	11 35	5 10	—	—	8 50	8 9	9 19	8						
S.	4	5 28	2 55	8 3	3 22	8 1	0 8	5 6	0 42	5 3	9 48	8 0	10 22	7 11						
M.	5	6 16	3 52	7 11	4 29	7 10	1 20	5 2	2 3	5 1	11 0	7 8	11 39	7 1						
Tu.	6	7 2	5 6	7 9	5 47	7 9	2 43	5 2	3 25	5 5	—	—	0 21	7						
W.	7	7 46	6 27	7 9	7 3	7 10	4 0	5 7	4 29	5 9	1 1	7 10	1 36	8						
Th.	8	8 30	7 34	7 11	8 2	8 2	4 55	6 0	5 17	6 3	2 7	8 4	2 34	8						
F.	9	9 13	8 23	8 4	8 42	8 7	5 35	6 5	5 52	6 8	2 54	9 1	3 12	9						
S.	10	9 57	9 0	8 10	9 17	9 0	6 10	6 10	6 27	7 1	3 28	9 9	3 44	10						
S.	11	10 41	9 34	9 2	9 51	9 3	6 46	7 3	7 3	7 5	4 0	10 5	4 17	10						
M.	12	11 27	10 8	9 5	10 25	9 6	7 22	7 7	7 39	7 8	4 35	11 0	4 52	11						
Tu.	13	0 16	10 42	9 6	10 58	9 7	7 56	7 9	8 11	7 10	5 12	11 4	5 28	11						
W.	14	1 8	11 15	9 7	11 33	9 6	8 27	7 10	8 44	7 9	5 45	11 5	6 2	11						
Th.	15	2 3	11 52	9 6	—	—	9 2	7 8	9 19	7 6	6 21	11 3	6 41	11						
F.	16	2 59	0 12	9 5	0 33	9 4	9 38	7 4	9 59	7 2	7 1	10 9	7 22	10						
S.	17	3 57	0 56	9 3	1 21	9 2	10 21	7 0	10 45	6 9	7 44	10 1	8 8	9						
S.	18	4 55	1 47	9 0	2 15	8 10	11 16	6 5	11 54	6 2	8 34	9 6	9 7	9						
M.	19	5 52	2 46	8	3 19	8 6	—	—	0 36	5 11	9 44	8 11	10 23	8						
Tu.	20	6 47	3 54	8 4	4 34	8 3	1 20	5 10	2 8	5 10	11 5	8 7	11 47	8						
W.	21	7 40	5 14	8	5 55	8 3	2 50	6 0	3 31	6 3	—	—	0 29	8						
Th.	22	8 31	6 35	8 4	7 11	8 5	4 5	6 6	4 33	6 9	1 8	9 0	1 43	9						
F.	23	9 21	7 40	8 7	8 7	8 10	4 56	6 11	5 19	7 1	2 12	9 7	2 38	10						
S.	24	10 12	8 31	9 1	8 54	9 3	5 41	7 4	6 4	7 6	3 1	10 4	3 22	10						
S.	25	11 2	9 16	9 5	9 37	9 6	6 26	7 8	6 49	7 9	3 42	10 11	4 3	11						
M.	26	11 53	9 58	9 7	10 17	9 8	7 11	7 10	7 32	7 11	4 24	11 4	4 45	11						
Tu.	27	morn.	10 37	9 7	10 56	9 7	7 51	7 11	8 10	7 11	5 6	11 6	5 27	11						
W.	28	0 45	11 15	9 6	11 34	9 5	8 28	7 10	8 46	7 8	5 46	11 4	6 4	11						
Th.	29	1 37	11 53	9 4	—	—	9 3	7 5	9 20	7 3	6 23	10 11	6 42	10						
F.	30	2 29	0 13	9 3	0 33	9 1	9 38	7 0	9 56	6 9	7 1	10 3	7 20	9 1						
S.	31	3 19	0 53	9 0	1 15	8 10	10 15	6 6	10 35	6 3	7 39	9 6	7 59	9						
Half Mean Spring Range.			4ft. 9in.						3ft. 10in.						5ft. 7in.					
Phases of the Moon.							Moon's Declination at Noon.													
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°			
Last Quarter-							1	20	N. 10	9	4	N. 7	17	21	8. 5	25	9	N. 3		
New - - - - -							2	21	8	10	0	8.20	18	20	0	26	13	3		
First Quarter							3	21	5	11	4	52	19	17	40	27	17			
Full - - - - -							4	20	3	12	9	17	20	14	17	28	19	2		
							5	18	8	13	13	20	21	10	3	29	20	4		
							6	15	28	14	16	47	22	5	17	30	21			
In Apogee - -							7	12	10	15	19	22	23	0	14	31	20	2		
In Perigee - -							8	8	20	16	20	51	24	4	N. 47					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—

. BELFAST subtract 2 m

LONDONDERRY add 4 m.

SLIGO BAY add 2 m.

OCTOBER, 1863.

GALWAY.					QUEENSTOWN.					WATERFORD.					C's AGE AT NOON.
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			
Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.		
6 46 14 1		7 6 13 6			7 11 11 3		7 30 10 11			7 32 12 2		7 49 11 10		18.3	
7 27 12 11		7 50 12 4			7 49 10 6		8 7 10 2			8 7 11 6		8 25 11 2		19.3	
8 12 11 9		8 36 11 1			8 27 9 9		8 48 9 5			8 43 10 9		9 3 10 5		20.3	
9 1 10 6		9 31 10 2			9 9 9 1		9 34 8 9			9 25 10 1		9 54 9 9		(
10 8 9 11		10 48 9 10			10 8 8 7		10 46 8 5			10 30 9 5		11 6 9 3		22.3	
11 33 9 11		— — — —			11 30 8 5		— — — —			11 47 9 2		— — — —		23.3	
0 13 10 1		0 48 10 5			0 11 8 7		0 48 8 9			0 24 9 3		0 59 9 6		24.3	
1 18 10 10		1 45 11 4			1 23 9 0		1 54 9 4			1 31 9 9		2 3 10 1		25.3	
2 6 11 10		2 26 12 4			2 20 9 8		2 42 10 0			2 31 10 5		2 55 10 9		26.3	
2 45 12 9		3 3 13 3			3 3 10 4		3 22 10 8			3 18 11 1		3 40 11 5		27.3	
3 20 13 7		3 37 14 0			3 41 11 0		4 0 11 3			4 1 11 9		4 21 12 0		28.3	
3 55 14 4		4 12 14 7			4 18 11 6		4 36 11 8			4 40 12 2		4 58 12 4		●	
4 29 14 10		4 45 15 1			4 55 11 10		5 12 11 11			5 16 12 5		5 32 12 7		0.7	
5 4 15 2		5 23 15 1			5 31 12 0		5 50 12 0			5 51 12 8		6 10 12 8		1.7	
5 43 15 0		6 2 14 9			6 9 11 11		6 28 11 9			6 30 12 7		6 49 12 6		2.7	
6 22 14 6		6 44 14 2			6 48 11 7		7 9 11 4			7 9 12 5		7 30 12 3		3.7	
7 7 13 10		7 32 13 5			7 31 11 1		7 52 10 10			7 50 12 1		8 10 11 10		4.7	
7 58 12 11		8 27 12 4			8 14 10 6		8 40 10 2			8 32 11 6		8 56 11 3		5.7	
8 59 11 10		9 33 11 6			9 8 9 11		9 37 9 8			9 23 10 11		9 56 10 7)	
10 13 11 3		10 55 11 4			10 13 9 6		10 53 9 5			10 34 10 4		11 13 10 3		7.7	
11 41 11 6		— — — —			11 39 9 6		— — — —			11 54 10 3		— — — —		8.7	
0 20 11 10		0 55 12 3			0 19 9 9		0 57 10 0			0 31 10 5		1 7 10 8		9.7	
1 23 12 9		1 50 13 3			1 32 10 3		2 4 10 7			1 41 11 0		2 15 11 5		10.7	
2 15 13 8		2 40 14 1			2 32 10 11		2 58 11 3			2 46 11 9		3 14 12 0		11.7	
3 2 14 5		3 23 14 9			3 22 11 6		3 46 11 9			3 40 12 3		4 6 12 6		12.7	
3 44 14 11		4 5 15 1			4 7 11 10		4 28 11 11			4 30 12 7		4 51 12 7		○	
4 25 15 2		4 44 15 2			4 49 12 0		5 11 11 11			5 11 12 7		5 31 12 7		14.7	
5 4 15 0		5 24 14 10			5 32 11 10		5 52 11 9			5 52 12 6		6 12 12 5		15.7	
5 44 14 6		6 3 14 2			6 11 11 7		6 29 11 4			6 31 12 3		6 50 12 1		16.7	
6 22 13 10		6 42 13 4			6 48 11 1		7 6 10 10			7 9 11 11		7 27 11 9		17.7	
7 2 12 11		7 22 12 6			7 25 10 6		7 43 10 3			7 45 11 6		8 2 11 3		18.7	
{ Mean Spring } 7ft. 5in. Range.					5ft. 10in.					6ft. 2in.					

Equation of Time at Noon.

M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
10 14		9	12 36		17	14 30		25	15 46	
10 33		10	12 52		18	14 42		26	15 53	
10 52		11	13 8		19	14 53		27	15 59	
11 10		12	13 23		20	15 3		28	16 4	
11 28		13	13 37		21	15 13		29	16 8	
11 46		14	13 51		22	15 22		30	16 12	
12 3		15	14 5		23	15 31		31	16 15	
12 20		16	14 17		24	15 39				

of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

NOVEMBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRAMIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.
S.	1	4m 8	6 46	15 5	7 7	14 9	8 27	13 7	8 46	12 7	2 27	11 3	2 47	11 3
M.	2	4 55	7 29	14 2	7 54	13 7	9 6	12 10	9 28	11 9	3 7	10 8	3 27	11 9
Tu.	3	5 40	8 22	13 3	8 56	12 11	9 52	12 2	10 21	11 3	3 51	10 2	4 18	11 3
W.	4	6 24	9 31	12 10	10 8	13 0	10 52	11 10	11 30	11 2	4 50	9 8	5 24	11 2
Th.	5	7 6	10 47	13 8	11 22	13 6	—	—	0 7	12 0	5 59	9 7	6 36	11 0
F.	6	7 49	11 54	13 11	—	—	0 45	11 8	1 19	12 7	7 9	9 11	7 41	11 1
S.	7	8 33	0 22	14 6	0 49	15 1	1 53	12 5	2 23	13 4	8 11	10 6	8 40	11 0
S.	8	9 18	1 14	15 9	1 34	16 5	2 49	13 4	3 16	14 2	9 5	11 2	9 28	11 1
M.	9	10 6	1 54	17 1	2 12	17 8	3 40	14 2	4 3	14 7	9 49	11 10	10 8	11 1
Tu.	10	10 57	2 31	18 3	2 52	18 9	4 25	14 10	4 46	15 1	10 27	12 4	10 49	11 1
W.	11	11 52	3 13	19 1	3 32	19 3	5 7	15 4	5 27	15 5	11 9	12 8	11 27	11 1
Th.	12	0 49	3 53	19 5	4 15	19 6	5 48	15 7	6 9	15 7	11 49	12 10	—	—
F.	13	1 49	4 35	19 6	4 56	19 4	6 32	15 10	6 50	15 5	0 12	12 10	0 35	11 1
S.	14	2 49	5 18	19 1	5 40	18 9	7 12	15 9	7 33	15 2	0 56	12 9	1 19	11 1
S.	15	3 47	6 4	18 5	6 29	17 10	7 56	15 5	8 18	14 8	1 41	12 6	2 5	11 1
M.	16	4 43	6 55	17 3	7 23	16 7	8 43	15 0	9 9	14 0	2 30	12 1	2 56	11 1
Tu.	17	5 37	7 52	16 3	8 24	15 6	9 36	14 3	10 3	13 2	3 23	11 7	3 50	11 1
W.	18	6 28	9 5	15 2	9 32	15 0	10 35	13 8	11 8	12 9	4 21	11 1	4 51	11 1
Th.	19	7 18	10 11	15 0	10 49	15 2	11 45	13 4	—	—	5 26	10 8	6 2	11 1
F.	20	8 7	11 27	15 4	—	—	0 25	12 9	1 3	13 7	6 37	10 8	7 14	11 1
S.	21	8 56	0 2	15 8	0 32	16 1	1 40	13 5	2 14	14 0	7 50	11 1	8 23	11 1
S.	22	9 45	1 1	16 6	1 27	16 11	2 44	14 0	3 12	14 5	8 52	11 7	9 21	11 1
M.	23	10 36	1 52	17 5	2 15	17 9	3 39	14 6	4 4	14 8	9 47	12 0	10 11	11 1
Tu.	24	11 28	2 36	18 1	2 56	18 4	4 28	14 10	4 49	15 0	10 31	12 2	10 52	11 1
W.	25	morn.	3 18	18 5	3 38	18 5	5 10	15 2	5 31	15 0	11 14	12 3	11 34	11 1
Th.	26	0 19	3 59	18 3	4 18	18 2	5 51	15 3	6 10	14 11	11 55	12 3	—	—
F.	27	1 10	4 35	18 0	4 52	17 9	6 30	15 2	6 45	14 7	0 15	12 2	0 34	11 1
S.	28	2 0	5 10	17 6	5 27	17 3	7 2	14 11	7 17	14 2	0 53	11 11	1 11	11 1
S.	29	2 48	5 45	16 11	6 4	16 7	7 33	14 6	7 51	13 6	1 29	11 9	1 46	11 1
M.	30	3 34	6 22	16 2	6 41	15 9	8 7	13 11	8 24	12 11	2 5	11 5	2 24	11 1

Half Mean Spring } 9ft. 6in.
Range.

7ft. 9in.

6ft. 4in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter -	3	3	34	Afternoon.	1	18	N.44	9	11	S.55	17	10	S.59	25	2	
New - - - - -	11	7	59	Morning.	2	16	18	10	15	38	18	6	20	26	2	
First Quarter	18	3	5	Morning.	3	13	13	11	18	35	19	1	25	27	2	
Full - - - - -	25	9	1	Morning.	4	9	35	12	20	28	20	3	N.31	28	1	
					5	5	32	13	21	5	21	8	13	29	1	
In Apogee - -	3	1	0	Morning.	6	1	13	14	20	20	22	12	27	30	1	
In Perigee - -	15	1	0	Morning.	7	3	S.16	15	18	15	23	16	1			
In Apogee - -	30	10	0	Afternoon.	8	7	42	16	15	3	24	18	43			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 Brest add 18 m. Devonport add 17 m. Portsmouth add 4

NOVEMBER, 1863.

DOVER.					SHEERNESS.					LONDON.					C's AGE AT NOON.
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			
Time. L. M. F. I.	Height.	Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.		
2 7 16 6		2 28 16 1			3 36 14 8		3 55 14 3			5 6 17 9		5 26 17 5		19.7	
2 48 15 7		3 8 15 2			4 16 13 11		4 38 13 7			5 46 17 0		6 9 16 8		20.7	
3 32 14 8		3 57 14 3			5 1 13 3		5 28 12 11			6 31 16 3		6 56 15 11		(
4 27 13 11		4 58 13 9			5 58 12 9		6 35 12 6			7 27 15 8		8 1 15 6		22.7	
5 29 13 9		6 2 13 11			7 12 12 7		7 50 12 8			8 39 15 5		9 16 15 5		23.7	
6 35 14 3		7 7 14 8			8 28 12 10		9 0 13 2			9 52 15 6		10 26 15 8		24.7	
7 37 15 2		8 5 15 8			9 31 13 6		9 59 13 10			10 58 15 11		11 27 16 3		25.7	
8 29 16 2		8 51 16 8			10 24 14 2		10 48 14 6			11 53 16 7		— — —		26.7	
9 12 17 2		9 32 17 7			11 8 14 10		11 27 15 2			0 17 17 0		0 37 17 4		27.7	
9 54 18 0		10 17 18 4			11 45 15 6		— — —			0 58 17 9		1 17 18 1		28.7	
0 37 18 7		10 59 18 9			0 4 15 9		0 25 16 0			1 36 18 5		1 56 18 9		●	
1 22 18 11		11 46 19 0			0 46 16 2		1 5 16 3			2 16 19 0		2 35 19 2		1.2	
— — —		0 9 19 0			1 25 16 4		1 47 16 4			2 54 19 4		3 15 19 5		2.2	
0 32 19 0		0 56 18 10			2 7 16 3		2 27 16 2			3 34 19 6		3 56 19 5		3.2	
1 20 18 7		1 45 18 4			2 48 16 1		3 10 15 10			4 18 19 3		4 41 19 0		4.2	
2 11 18 0		2 37 17 6			3 34 15 7		3 59 15 3			5 4 18 9		5 29 18 6		5.2	
3 4 17 1		3 31 16 8			4 26 14 11		4 54 14 7			5 56 18 2		6 25 17 9		6.2	
4 0 16 2		4 28 15 9			5 24 14 4		5 59 14 0			6 55 17 5		7 27 17 2)	
5 0 15 6		5 32 15 5			6 34 13 9		7 13 13 9			8 2 16 11		8 40 16 9		8.2	
6 4 15 6		6 40 15 9			7 53 13 10		8 29 14 0			9 17 16 8		9 55 16 8		9.2	
7 16 16 1		7 48 16 6			9 5 14 3		9 39 14 6			10 31 16 10		11 7 17 0		10.2	
8 16 16 9		8 44 17 1			10 8 14 8		10 35 14 11			11 37 17 3		— — —		11.2	
9 10 17 5		9 35 17 8			11 1 15 2		11 25 15 4			0 5 17 6		0 30 17 9		12.2	
9 57 17 10		10 20 18 0			11 48 15 6		— — —			0 56 18 0		1 19 18 2		13.2	
0 42 18 0		11 6 18 1			0 8 15 8		0 30 15 9			1 41 18 4		2 2 18 6		○	
1 28 18 0		11 48 17 11			0 51 15 9		1 11 15 9			2 22 18 7		2 41 18 8		15.2	
— — —		0 8 17 10			1 31 15 9		1 49 15 7			3 0 18 8		3 17 18 7		16.2	
0 28 17 8		0 48 17 6			2 6 15 5		2 23 15 4			3 35 18 6		3 52 18 5		17.2	
7 17 4		1 26 17 1			2 40 15 2		2 57 15 0			4 11 18 3		4 28 18 1		18.2	
45 16 11		2 5 16 8			3 15 14 9		3 34 14 7			4 46 17 11		5 4 17 8		19.2	
an Spring } 9ft. 4in. nge.					8ft. 0in.					9ft. 7in.					

Equation of Time at Noon.

M.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
17		9	16	2		17	14	54		25	12	54	
18		10	15	57		18	14	42		26	12	35	
18		11	15	50		19	14	29		27	12	16	
18		12	15	43		20	14	15		28	11	56	
16		13	15	35		21	14	0		29	11	35	
14		14	15	26		22	13	45		30	11	14	
11		15	15	16		23	13	28					
7		16	15	6		24	13	11					

High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, — for
an subtract 3 m. SHEERNESS subtract 3 m. LONDON 0 m.
F 2

NOVEMBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.
S.	1	4 m 8	2 55	10 6	3 13	10 3	9 31	18 1	9 52	17 7	6 26	12 3	6 48	11 1
M.	2	4 55	3 33	10 1	3 53	9 10	10 14	17 1	10 40	16 7	7 10	11 6	7 33	11 2
Tu.	3	5 40	4 14	9 5	4 40	9 6	11 9	16 2	11 43	15 10	8 0	10 10	8 30	10 10
W.	4	6 24	5 8	9 5	5 42	9 4	—	—	0 20	15 7	9 6	10 6	9 43	10 10
Th.	5	7 6	6 18	9 4	6 58	9 5	0 54	15 6	1 27	15 8	10 19	10 6	10 54	10 10
F.	6	7 49	7 36	9 7	8 8	9 9	2 1	15 11	2 30	16 3	11 24	10 11	11 52	11 1
S.	7	8 33	8 38	9 11	9 6	10 2	3 0	16 10	3 27	17 5	—	—	0 18	11 1
S.	8	9 18	9 32	10 5	9 57	10 8	3 53	18 0	4 17	18 6	0 43	12 0	1 7	11 1
M.	9	10 6	10 19	10 10	10 38	11 1	4 37	19 1	4 55	19 6	1 29	12 10	1 50	11 1
Tu.	10	10 57	10 57	11 3	11 17	11 6	5 13	19 11	5 33	20 4	2 9	13 6	2 29	11 1
W.	11	11 52	11 39	11 7	11 59	11 8	5 55	20 7	6 16	20 10	2 50	14 0	3 8	11 1
Th.	12	0 49	—	—	0 17	11 9	6 35	21 0	6 56	21 2	3 27	14 6	3 48	11 1
F.	13	1 49	0 37	11 9	1 0	11 9	7 19	21 3	7 40	21 3	4 9	14 8	4 30	11 1
S.	14	2 49	1 21	11 1	1 42	11 6	8 0	21 2	8 23	20 10	4 51	14 6	5 13	11 1
S.	15	3 47	2 5	11 5	2 28	11 3	8 45	20 6	9 10	20 1	5 36	14 0	6 1	11 1
M.	16	4 43	2 52	11 1	3 17	10 11	9 35	19 8	10 1	19 2	6 29	13 4	6 57	11 1
Tu.	17	5 37	3 42	10 9	4 9	10 7	10 30	18 8	11 4	18 3	7 26	12 8	7 57	11 1
W.	18	6 28	4 38	10 5	5 10	10 3	11 42	17 10	—	—	8 31	12 1	9 5	11 1
Th.	19	7 18	5 41	10 2	6 19	10 2	0 19	17 6	0 56	17 5	9 44	11 9	10 21	11 1
F.	20	8 7	7 1	10 2	7 37	10 3	1 29	17 5	2 1	17 7	10 54	11 10	11 27	11 1
S.	21	8 56	8 12	10 5	8 46	10 7	2 34	17 11	3 7	18 5	11 58	12 4	—	11 1
S.	22	9 45	9 15	10 9	9 44	10 11	3 37	18 10	4 4	19 2	0 27	12 8	0 55	11 1
M.	23	10 36	10 12	11 1	10 36	11 3	4 30	19 6	4 53	19 10	1 22	13 2	1 48	11 1
Tu.	24	11 28	11 0	11 4	11 21	11 5	5 15	20 0	5 37	20 2	2 12	13 6	2 33	11 1
W.	25	morn.	11 42	11 5	—	—	5 59	20 2	6 21	20 3	2 54	13 9	3 14	11 1
Th.	26	0 19	0 3	11 5	0 24	11 4	6 42	20 3	7 2	20 3	3 34	14 0	3 54	11 1
F.	27	1 10	0 44	11 3	1 3	11 2	7 22	20 1	7 39	19 11	4 12	13 10	4 39	11 1
S.	28	2 0	1 20	11 1	1 38	10 11	7 57	19 9	8 15	19 6	4 47	13 6	5 5	11 1
S.	29	2 48	1 57	10 10	2 15	10 9	8 32	19 3	8 51	18 10	5 23	13 1	5 42	11 1
M.	30	3 34	2 33	10 7	2 52	10 5	9 10	18 6	9 29	18 2	6 1	12 7	6 22	11 1
Half Mean Spring } Range.			5 ft. 9 in.				10 ft. 5 in.				7 ft. 2 in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°
Last Quarter - 3 3 34 Afternoon.							1	18	N. 44	9	11	8. 55	17	10
New - - - - 11 7 59 Morning.							2	16	18	10	15	38	18	6
First Quarter - 18 3 5 Morning.							3	13	13	11	18	35	19	1
Full - - - - 25 9 1 Morning.							4	9	35	12	20	28	20	3
							5	5	32	13	21	5	21	8
In Apogee - - 3 1 0 Morning.							6	1	13	14	20	20	22	12
In Perigee - - 15 1 0 Morning.							7	3	16	15	18	15	23	16
In Apogee - - 30 10 0 Afternoon.							8	7	42	16	15	3	24	18

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 HARWICH subtract 6 m. HULL add 1 m. SUNDERLAND add 2 m.

NOVEMBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRAMIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTER.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	
S.	1	4m 8	2 50	8 11	3 10	8 10	2 122	6	2 20	21 10	9 11	17 5	9 30	10 10	
M.	2	4 55	3 30	8 8	3 51	8 6	2 40	21 3	3 22	20 7	9 49	16 4	10 10	10 10	
Tu.	3	5 40	4 15	8 4	4 43	8 3	3 28	19 11	3 58	19 6	10 34	15 3	11 3	11 3	
W.	4	6 24	5 16	8 1	5 50	8 0	4 34	19 2	5 12	19 1	11 34	14 8	—	—	
Th.	5	7 6	6 25	8 0	7 2	8 0	5 51	19 3	6 31	19 6	0 7	14 9	0 44	0 44	
F.	6	7 49	7 34	8 1	8 6	8 3	7 42	20 0	7 34	20 7	1 21	15 2	1 55	1 55	
S.	7	8 33	8 34	8 5	9 2	8 8	8 32	21 3	8 27	21 11	2 26	16 3	2 56	2 56	
S.	8	9 18	9 27	8 10	9 49	9 0	8 50	22 7	9 10	23 4	3 22	17 8	3 46	3 46	
M.	9	10 6	10 9	9 2	10 29	9 3	9 29	24 0	9 46	24 7	4 9	18 11	4 31	4 31	
Tu.	10	10 57	10 50	9 5	11 13	9 6	10 6	25 1	10 27	25 6	4 54	20 0	5 17	5 17	
W.	11	11 52	11 34	9 7	11 55	9 9	10 47	25 10	11 7	26 2	5 39	20 10	5 59	5 59	
Th.	12	0 49	—	—	0 17	9 10	11 28	26 5	11 50	26 6	6 19	21 4	6 41	6 41	
F.	13	1 49	0 39	9 10	1 1	9 11	—	—	0 12	26 6	7 22	21 5	7 23	7 23	
S.	14	2 49	1 22	9 10	1 44	9 10	0 33	26 4	0 55	26 0	7 45	21 0	8 8	8 8	
S.	15	3 47	2 6	9 9	2 30	9 7	1 17	25 7	1 40	25 0	8 32	20 3	8 56	8 56	
M.	16	4 43	2 54	9 6	3 19	9 4	2 42	24 6	2 29	23 11	9 20	19 3	9 45	9 45	
Tu.	17	5 37	3 46	9 3	4 14	9 1	2 57	23 3	3 25	22 8	10 11	18 3	10 38	10 38	
W.	18	6 28	4 45	8 11	5 16	8 10	3 59	22 1	4 33	21 7	11 4	17 1	11 36	11 36	
Th.	19	7 18	5 52	8 8	6 28	8 7	5 13	21 5	5 54	21 7	—	—	0 9	0 9	
F.	20	8 7	7 3	8 7	7 39	8 8	6 32	21 9	7 8	22 1	0 45	16 10	1 27	1 27	
S.	21	8 56	8 14	8 10	8 45	8 11	7 42	22 0	8 12	23 0	2 5	17 5	2 39	2 39	
S.	22	9 45	9 14	9 1	9 42	9 2	8 38	23 6	9 3	23 11	3 9	18 5	3 40	3 40	
M.	23	10 36	10 7	9 3	10 31	9 3	9 27	24 4	9 49	24 8	4 7	19 3	4 33	4 33	
Tu.	24	11 28	10 54	9 4	11 17	9 4	10 10	24 10	10 31	25 0	4 58	19 10	5 22	5 22	
W.	25	morn.	11 40	9 5	—	—	10 52	25 1	11 13	25 1	5 44	20 2	6 6	6 6	
Th.	26	0 19	0 2	9 5	0 22	9 5	11 34	25 1	11 53	24 11	6 25	20 2	6 45	6 45	
F.	27	1 10	0 42	9 5	1 1	9 5	—	—	0 11	24 9	7 1	19 11	7 19	7 19	
S.	28	2 0	1 19	9 4	1 36	9 4	0 30	24 7	0 47	24 3	7 37	19 5	7 55	7 55	
S.	29	2 48	1 54	9 3	2 12	9 2	1 52	23 11	1 22	23 5	8 13	18 10	8 32	8 32	
M.	30	3 34	2 30	9 1	2 48	9 0	1 40	23 0	1 58	22 7	8 51	18 2	9 8	9 8	
Half Mean Spring } Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter - 3 3 34 Afternoon.							1	18	N.44	9	11	8.55	17	10	8.59
New - - - - - 11 7 59 Morning.							2	16	18	10	15	38	18	6	20
First Quarter - 18 3 5 Morning.							3	13	13	11	18	35	19	1	25
Full - - - - - 25 9 1 Morning.							4	9	35	12	20	28	20	3	N.31
							5	5	32	13	21	5	21	8	13
In Apogee - - 3 1 0 Morning.							6	1	13	14	20	20	22	12	27
In Perigee - - 15 1 0 Morning.							7	3	8.16	15	18	15	23	16	1
In Apogee - - 30 10 0 Afternoon.							8	7	42	16	15	3	24	18	43

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 GREENOCK add 19 m. LIVERPOOL add 13 m. PEMBROKE add

NOVEMBER, 1863.

WESTON-SUPER-MARE.					HOLYHEAD.					KINGSTOWN.					C's AGE AT NOON.	
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.				
Time. H. M. F. I.	Height	Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.			
9 44 31 10		10 0 30 11			0 57 13 10		1 19 13 6			1 57 9 7		2 19 9 5		19.7		
10 16 29 11		10 37 28 11			1 42 13 1		2 5 12 9			2 41 9 2		3 4 9 0		20.7		
11 3 28 2		11 36 27 7			2 33 12 4		3 5 12 2			3 31 8 10		4 3 8 8		(
— —		0 9 27 3			3 42 12 0		4 21 11 10			4 40 8 6		5 14 8 6		22.7		
0 44 27 5		1 22 27 8			4 58 12 1		5 34 12 4			5 47 8 7		6 21 8 9		23.7		
1 56 28 1		2 28 28 10			6 4 12 7		6 33 12 10			6 51 8 11		7 20 9 1		24.7		
3 0 29 9		3 31 30 8			6 59 13 3		7 23 13 7			7 47 9 4		8 14 9 6		25.7		
4 0 31 8		4 26 32 9			7 46 14 0		8 6 14 5			8 39 9 9		9 2 10 0		26.7		
4 50 33 10		5 13 34 9			8 24 14 10		8 41 15 2			9 23 10 2		9 42 10 5		27.7		
5 35 35 8		5 58 36 4			9 0 15 6		9 21 15 9			10 0 10 7		10 19 10 9		28.7		
6 21 36 10		6 42 37 3			9 41 16 0		10 0 16 1			10 37 10 11		10 56 11 0		●		
7 3 37 9		7 25 37 11			10 18 16 3		10 37 16 3			11 16 11 1		11 38 11 1		1.2		
7 46 37 11		8 6 37 10			10 57 16 3		11 18 16 2			12 0 11 0		— —		2.2		
8 27 37 6		8 48 37 1			11 42 15 11		— —			0 22 10 11		0 45 10 10		3.2		
9 10 36 6		9 32 35 8			0 6 15 8		0 33 15 5			1 9 10 8		1 34 10 5		4.2		
9 53 34 10		10 15 33 10			1 0 15 1		1 28 14 8			2 1 10 3		2 28 10 1		5.2		
10 38 32 11		11 6 32 0			1 58 14 4		2 29 14 0			2 57 9 11		3 27 9 9		6.2		
11 36 31 3		— —			3 4 13 9		3 41 13 6			4 3 9 6		4 39 9 4)		
0 11 30 10		0 47 30 8			4 22 13 5		5 1 13 6			5 16 9 3		5 50 9 4		8.2		
1 23 30 10		2 1 31 2			5 35 13 8		6 8 13 10			6 22 9 5		6 55 9 7		9.2		
2 37 31 8		3 13 32 3			6 39 14 0		7 8 14 3			7 27 9 9		7 57 9 11		10.2		
3 46 32 11		4 18 33 8			7 34 14 6		7 59 14 10			8 26 10 0		8 55 10 2		11.2		
4 43 34 4		5 15 34 11			8 23 15 0		8 44 15 2			9 21 10 4		9 44 10 5		12.2		
5 39 35 4		6 3 35 7			9 4 15 4		9 25 15 5			10 3 10 6		10 22 10 7		13.2		
6 26 35 9		6 48 35 10			9 46 15 6		10 6 15 6			10 42 10 8		11 3 10 8		○		
7 9 35 11		7 28 35 9			10 24 15 5		10 40 15 4			11 22 10 8		11 41 10 7		15.2		
7 45 35 6		8 2 35 2			10 56 15 2		11 14 15 0			11 59 10 6		— —		16.2		
8 19 34 11		8 36 34 7			11 33 14 10		11 53 14 8			0 18 10 4		0 37 10 3		17.2		
8 52 34 1		9 9 33 7			— —		0 12 14 5			0 56 10 1		1 15 9 11		18.2		
9 26 33 0		9 42 32 4			0 33 14 2		0 54 13 11			1 34 9 9		1 54 9 8		19.2		
Mean Spring } Range.					18ft. 7in.					8ft. 0in.					5ft. 6in.	

Equation of Time at Noon.

M. S.		M. D.	M. S.		M. D.	M. S.		M. D.	M. S.	
16 17	Add.	9	16 2	Add.	17	14 54	Add.	25	12 54	Add.
16 18		10	15 57		18	14 42		26	12 35	
16 18		11	15 50		19	14 29		27	12 16	
16 18		12	15 43		20	14 15		28	11 56	
16 16		13	15 35		21	14 0		29	11 35	
16 14		14	15 26		22	13 45		30	11 14	
16 11		15	15 16		23	13 28				
16 7		16	15 6		24	13 11				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

NOVEMBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.																		
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.																
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.															
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.															
S.	1	4m 8	1 37	8 8	2 0	8 6	11 1	6 0	11 29	5 9	8 20	8 11	8 44	8															
M.	2	4 55	2 23	8 4	2 47	8 3	12 0	5 6	—	—	9 11	8 4	9 41	8															
Tu.	3	5 40	3 15	8 1	3 45	8 0	0 34	5 4	1 12	5 3	10 14	■ 0	10 52	7 1															
W.	4	6 24	4 20	7 11	4 55	7 10	1 54	5 3	2 32	5 4	11 28	7 11	—	—															
Th.	5	7 6	5 29	7 10	6 4	7 11	3 6	5 6	3 39	5 9	0 3	8 0	0 38	8 1															
F.	6	7 49	6 36	7 11	7 6	8 0	4 7	5 11	4 30	6 1	1 9	8 3	1 39	8 4															
S.	7	8 33	7 33	8 2	7 58	8 4	4 52	6 4	5 13	6 6	2 6	8 9	2 30	9 1															
S.	8	9 18	8 20	8 7	8 40	8 9	5 32	6 8	5 50	6 11	2 51	9 6	3 10	9 9															
M.	9	10 6	8 59	9 0	9 17	9 2	6 9	7 1	6 28	7 3	3 27	10 1	3 43	10 5															
Tu.	10	10 57	9 36	9 3	9 56	9 5	6 48	7 5	7 10	7 7	4 2	10 9	4 23	11 0															
W.	11	11 52	10 16	9 6	10 35	9 6	7 31	7 8	7 49	7 9	4 44	11 2	5 4	11 4															
Th.	12	0 49	10 55	9 7	11 15	9 6	8 8	7 11	8 28	7 10	5 25	11 5	5 46	11 5															
F.	13	1 49	11 35	9 6	11 57	9 6	8 47	7 9	9 7	7 8	6 6	11 4	6 27	11 3															
S.	14	2 49	—	—	0 21	9 5	9 28	7 6	9 50	7 4	6 50	11 0	7 13	10 8															
S.	15	3 47	0 45	9 4	1 12	9 3	10 13	7 2	10 39	6 11	7 37	10 5	8 2	10 1															
M.	16	4 43	1 40	9 2	2 9	9 0	11 10	6 8	11 46	6 5	8 29	9 9	9 0	9 6															
Tu.	17	5 37	2 40	8 10	3 11	8 8	—	—	0 25	6 2	9 35	9 3	10 13	9 1															
W.	18	6 28	3 45	8 7	4 20	8 6	1 8	6 1	1 51	6 0	10 51	9 0	11 30	8 11															
Th.	19	7 18	4 56	8 5	5 31	8 4	2 34	6 1	3 9	6 3	—	—	0 5	9 1															
F.	20	8 7	6 5	8 4	6 40	8 5	3 39	6 6	4 9	6 ■	0 39	9 1	1 13	9															
S.	21	8 56	7 13	8 6	7 42	8 7	4 35	6 9	4 58	6 11	1 46	9 4	2 15	9															
S.	22	9 45	8 8	8 9	8 33	8 11	5 20	7 0	5 43	7 1	2 39	9 10	3 3	10															
M.	23	10 36	8 57	9 1	9 20	9 2	6 7	7 3	6 30	7 4	3 25	10 3	3 46	10															
Tu.	24	11 28	9 40	9 3	10 1	9 3	6 52	7 4	7 14	7 5	4 6	10 8	4 27	10 0															
W.	25	morn.	10 21	9 4	10 42	9 3	7 36	7 5	7 56	7 5	4 49	10 10	5 11	10 0															
Th.	26	0 19	11 1	9 3	11 18	9 2	8 14	7 5	8 30	7 4	5 31	10 10	5 48	10 0															
F.	27	1 10	11 35	9 2	11 53	9 1	8 46	7 3	9 3	6 1	6 5	10 7	6 23	10 0															
S.	28	2 0	—	—	0 12	9 0	9 20	6 11	9 37	6 10	6 42	10 3	7 0	10 0															
S.	29	2 48	0 32	9 0	0 51	■ 11	9 54	6 8	10 12	6 6	7 18	9 9	7 36	9 5															
M.	30	3 34	1 11	8 10	1 33	8 9	10 32	6 4	10 53	6 2	7 55	9 3	8 15	9 5															
Half Mean Spring } Range.			4 ft. 9 in.				3 ft. 10 in.				5 ft. 7 in.																		
Phases of the Moon.															Moon's Declination at Noon.														
D. H. M.															M.D. ° ' "														
Last Quarter - 3 3 34 Afternoon.															1 18 N. 44 9 11 8. 55 17 10 8. 59 25 2 4														
New - - - - - 11 7 59 Morning.															2 16 18 10 15 38 18 6 20 26 2 1														
First Quarter 18 3 5 Morning.															3 13 13 11 18 35 19 1 25 27 2 4														
Full - - - - - 25 9 1 Morning.															4 9 35 12 20 28 20 3 N. 31 28 1 4														
In Apogee - - 3 1 0 Morning.															5 5 32 13 21 5 21 ■ 13 29 1 1														
In Perigee - - 15 1 0 Morning.															6 1 13 14 20 20 22 12 27 30 1 4														
In Apogee - - 30 10 0 Afternoon.															7 3 8. 16 15 18 15 23 16 1 24 18 43														
8 7 42 16 15 ■ 24 18 43																													

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required

BELFAST subtract 2 m.

LONDONDERRY add 4 m.

SLIGO BAY add 6 m.

NOVEMBER, 1863.

GALWAY.				QUEENSTOWN.				WATERFORD.				C's Age at Noon.
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	
7 44	12 0	8 6	11 6	8 1	9 11	8 20	9 8	8 20	10 11	8 37	10 8	19.7
8 29	11 0	8 55	10 7	8 41	9 4	9 2	9 1	8 55	10 5	9 18	10 1	20.7
9 24	10 4	10 0	10 2	9 28	8 11	10 0	8 9	9 47	9 10	10 22	9 7	21.7
10 36	10 2	11 13	10 3	10 34	8 8	11 10	8 9	10 55	9 6	11 28	9 6	22.7
1 50	10 6	—	—	11 48	8 10	—	—	—	—	0 1	9 6	23.7
0 21	10 9	0 51	11 1	0 20	9 0	0 52	9 2	0 32	9 9	1 2	9 11	24.7
1 17	11 6	1 31	11 11	1 23	9 5	1 52	9 9	1 32	10 2	2 2	10 6	25.7
2 3	12 5	2 24	12 10	2 18	10 0	2 41	10 4	2 30	10 10	2 56	11 2	26.7
2 44	13 3	3 3	13 8	3 3	10 8	3 23	11 0	3 19	11 5	3 41	11 9	27.7
3 22	14 0	3 43	14 4	3 44	11 3	4 6	11 6	4 4	12 0	4 28	12 2	28.7
4 4	14 7	4 23	14 10	4 27	11 8	4 47	11 10	4 50	12 4	5 10	12 5	29.7
4 42	15 1	5 5	15 2	5 9	11 11	5 31	12 0	5 30	12 7	5 52	12 8	30.7
5 27	15 7	5 49	15 0	5 53	12 0	6 14	11 11	6 14	12 8	6 36	12 7	31.7
6 11	14 9	6 34	14 6	6 36	11 9	6 59	11 7	6 58	12 6	7 20	12 5	32.7
6 59	14 2	7 26	13 10	7 23	11 4	7 47	11 1	7 43	12 3	8 6	12 1	33.7
7 53	13 5	8 22	12 11	8 11	10 10	8 36	10 7	8 29	11 10	8 53	11 7	34.7
8 52	12 5	9 25	12 1	9 3	10 4	9 31	10 1	9 17	11 4	9 48	11 0	35.7
9 59	11 10	10 38	11 9	10 1	9 10	10 37	9 9	10 22	10 9	10 58	10 7	36.7
11 16	11 10	11 51	11 11	11 13	9 9	11 49	9 9	11 31	10 6	—	—	37.7
—	—	0 25	12 2	—	—	0 25	9 11	0 3	10 6	0 36	10 8	38.7
0 57	12 5	1 26	12 8	1 1	10 1	1 35	10 3	1 10	10 9	1 44	11 0	39.7
1 52	13 0	2 17	13 3	2 5	10 5	2 34	10 8	2 16	11 3	2 48	11 5	40.7
2 43	13 6	3 6	13 9	3 1	10 10	3 26	11 0	3 17	11 7	3 44	11 9	41.7
3 27	13 11	3 47	14 0	3 48	11 2	4 10	11 3	4 9	11 11	4 33	12 0	42.7
4 8	14 1	4 29	14 2	4 32	11 4	4 54	11 4	4 55	12 11	5 17	12 0	43.7
4 48	14 3	5 8	14 2	5 15	11 4	5 35	11 3	5 36	12 11	5 55	12 0	44.7
5 26	14 0	5 44	13 10	5 53	11 2	6 11	11 1	6 13	11 11	6 32	11 10	45.7
6 3	13 8	6 21	13 5	6 29	11 0	6 47	10 10	6 50	11 5	7 8	11 8	46.7
6 40	13 1	6 59	12 10	7 5	10 8	7 23	10 6	7 25	11 6	7 42	11 5	47.7
7 19	12 7	7 39	12 3	7 41	10 3	7 58	10 1	7 59	11 3	8 16	11 1	48.7
Mean Spring Range.		7ft. 5in.		5ft. 10in.		6ft. 2in.						

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
16 17	Add.	9	16 2	Add.	17	14 54	Add.	25	12 54	Add.
16 18		10	15 57		18	14 42		26	12 35	
16 18		11	15 50		19	14 29		27	12 16	
16 18		12	15 43		20	14 15		28	11 56	
16 16		13	15 35		21	14 0		29	11 35	
16 14		14	15 26		22	13 45		30	11 14	
16 11		15	15 16		23	13 28				
16 7		16	15 6		24	13 11				

is of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
 GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.

DECEMBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.										
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.						
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.									
		H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.				
Tu.	1	4m18	7 3 15 4	7 23 14 11	8 40 13 3	9 0 12 4	2 43 11 1	3 3 10 11																					
W.	2	5 1	7 45 14 5	8 9 14 0	9 20 12 8	9 40 11 9	3 22 10 9	3 43 10 7																					
Th.	3	5 43	8 34 13 9	9 3 13 7	10 6 12 3	10 31 11 7	4 6 10 4	4 30 10 2																					
F.	4	6 26	9 34 13 6	10 8 13 7	10 59 12 0	11 33 11 7	4 58 10 0	5 27 9 11																					
S.	5	7 9	10 45 13 9	11 19 14 0	—	—	0 9 12 3	6 34 10 0																					
S.	6	7 55	11 52 14 5	—	—	0 47 12 2	1 22 12 9	7 39 10 5																					
M.	7	8 44	0 22 14 10	0 50 15 5	1 55 12 11	2 27 13 3	8 11 10 8	8 41 11 0																					
Tu.	8	9 36	1 17 16 1	1 41 16 9	2 57 13 7	3 25 14 0	9 9 11 4	9 34 11 8																					
W.	9	10 32	2 4 17 5	2 26 18 0	3 52 14 4	4 17 14 8	9 59 11 11	10 22 12 2																					
Th.	10	11 32	2 49 18 7	3 12 19 1	4 42 15 1	5 7 15 2	10 45 12 5	11 8 12 8																					
F.	11	0a34	3 35 19 4	4 0 19 7	5 30 15 8	5 54 15 6	11 31 12 10	11 56 12 11																					
S.	12	1 35	4 25 19 9	4 48 19 10	6 18 16 1	6 43 15 8	—	0 22 13 0																					
S.	13	2 34	5 12 19 9	5 35 19 7	7 6 16 2	7 29 15 6	0 47 13 0	1 11 12 11																					
M.	14	3 31	5 59 19 4	6 24 18 11	7 52 16 1	8 15 15 2	1 36 12 11	2 0 13 9																					
Tu.	15	4 24	6 49 18 5	7 14 17 9	8 39 15 8	9 2 14 6	2 25 12 7	2 49 12 5																					
W.	16	5 15	7 41 17 2	8 7 16 6	9 26 14 10	9 52 13 11	3 14 12 2	3 40 11 11																					
Th.	17	6 5	8 34 15 11	9 2 15 5	10 17 14 1	10 44 13 3	4 5 11 7	4 31 11 4																					
F.	18	6 54	9 34 15 1	10 9 14 11	11 12 13 5	11 44 12 10	4 58 11 0	5 28 10 9																					
S.	19	7 42	10 47 14 9	11 22 14 9	—	—	0 20 13 1	6 36 10 6																					
S.	20	8 32	12 0 14 10	—	—	0 57 12 11	1 32 13 1	7 47 10 8																					
M.	21	9 22	0 33 15 0	1 4 15 4	2 7 13 1	2 38 13 3	8 23 10 10	8 55 11 0																					
Tu.	22	10 13	1 32 15 9	1 57 16 2	3 11 13 7	3 39 13 9	9 24 11 2	9 51 11 4																					
W.	23	11 4	2 21 16 6	2 43 16 11	4 5 14 2	4 29 14 1	10 16 11 6	10 38 11 8																					
Th.	24	11 54	3 3 17 3	3 24 17 6	4 52 14 7	5 15 14 4	10 59 11 9	11 20 11 10																					
F.	25	morn.	3 43 17 7	4 2 17 8	5 36 14 11	5 55 14 5	11 39 11 11	11 58 12 0																					
S.	26	0 42	4 20 17 8	4 38 17 8	6 12 15 0	6 31 14 5	—	0 17 11 11																					
S.	27	1 29	4 54 17 8	5 12 17 7	6 48 15 0	7 2 14 3	0 35 11 11	0 54 11 11																					
M.	28	2 14	5 28 17 6	5 44 17 4	7 18 14 10	7 34 14 0	1 12 11 10	1 28 11 10																					
Tu.	29	2 57	6 0 17 2	6 18 16 11	7 50 14 5	8 6 13 6	1 45 11 9	2 2 11 8																					
W.	30	3 40	6 36 16 8	6 54 16 3	8 22 13 11	8 36 13 1	2 19 11 7	2 37 11 6																					
Th.	31	4 21	7 13 15 11	7 32 15 6	8 52 13 5	9 9 12 8	2 55 11 4	3 13 11 3																					
Half Mean Spring } Range.			9 ⁿ . 6 ⁱⁿ .								7 ⁿ . 9 ⁱⁿ .								6 ⁿ . 4 ⁱⁿ .										
Phases of the Moon.												Moon's Declination at Noon.																	
D. H. M.												M.D. ° ' "																	
Last Quarter - 3 0 14 Afternoon.												1 10 N. 50 9 19 S. 50 17 2 N. 22 25 19 N. 55																	
New - - - - - 10 8 23 Afternoon.												2 6 57 10 21 1 18 7 8 26 17 59																	
First Quarter - 17 11 46 Morning.												3 2 46 11 20 48 19 11 28 27 15 19																	
Full - - - - - 25 2 50 Morning.												4 18.35 12 19 9 20 15 10 28 12 2																	
												5 5 59 13 16 12 21 18 4 29 8 17																	
In Perigee - - 12 5 0 Afternoon.												6 10 14 14 12 15 22 20 2 30 4 13																	
In Apogee - - 28 3 0 Afternoon.												7 14 9 15 7 36 23 21 0 31 0 8																	
												8 17 27 16 2 38 24 20 57																	

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for

Brest add 18 m.

Devonport add 17 m.

Portsmouth add 4 m.

DECEMBER, 1863.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	
Tu.	1	2 24	16 4	2 43	16 0	3 53	14 4	4 12	14 1	5 24	17 5	5 43	17 3	20.2
W.	2	3 2	15 8	3 24	15 4	4 32	13 10	4 53	13 7	6 3	16 11	6 24	16 8	21.2
Th.	3	3 47	15 0	4 9	14 8	5 17	13 5	5 43	13 2	6 47	16 5	7 10	16 3	(
F.	4	4 34	14 5	5 2	14 4	6 11	13 0	6 42	12 11	7 36	16 0	8 8	15 11	23.2
S.	5	5 31	14 3	6 1	14 4	7 15	12 11	7 50	13 0	8 44	15 10	9 17	15 9	24.2
..	6	6 32	14 8	7 5	15 0	8 25	13 2	8 57	13 5	9 51	15 10	10 22	16 0	25.2
M.	7	7 37	15 5	8 6	15 11	9 29	13 9	9 59	14 0	10 54	16 3	11 25	16 6	26.2
Tu.	8	8 32	16 5	8 57	16 11	10 25	14 4	10 51	14 9	11 53	16 10	—	—	27.2
W.	9	9 22	17 4	9 47	17 10	11 14	15 0	11 37	15 4	0 20	17 2	0 43	17 7	28.2
Th.	10	10 12	18 3	10 37	18 7	11 59	15 8	—	—	1 5	17 11	1 30	18 3	●
F.	11	11 3	18 10	11 29	19 1	0 22	15 11	0 45	16 2	1 55	18 8	2 16	19 0	0.7
S.	12	11 56	19 3	—	—	1 8	16 4	1 32	16 5	2 39	19 3	3 2	19 5	1.7
..	13	0 21	19 4	0 47	19 3	1 56	16 6	2 19	16 6	3 26	19 7	3 49	19 8	2.7
M.	14	1 13	19 2	1 39	19 0	2 41	16 5	3 4	16 4	4 12	19 8	4 35	19 6	3.7
Tu.	15	2 5	18 10	2 30	18 5	3 28	16 2	3 53	15 11	4 58	19 4	5 23	19 2	4.7
W.	16	2 56	18 0	3 21	17 6	4 18	15 7	4 44	15 3	5 49	18 10	6 16	18 6	5.7
Th.	17	3 46	17 1	4 12	16 7	5 11	14 11	5 39	14 7	6 42	18 1	7 7	17 9	6.7
F.	18	4 37	16 0	5 3	15 8	6 9	14 3	6 40	13 11	7 36	17 5	8 7	17 1	7.7
S.	19	5 33	15 4	6 4	15 2	7 14	13 9	7 51	13 9	8 42	16 10	9 17	16 8	8.7
..	20	6 36	15 3	7 12	15 5	8 28	13 9	9 2	13 10	9 52	16 6	10 28	16 6	9.7
M.	21	7 48	15 8	8 20	15 11	9 37	14 0	10 10	14 2	11 5	16 6	11 39	16 7	10.7
Tu.	22	8 47	16 2	9 14	16 5	10 39	14 4	11 6	14 6	—	—	0 7	16 9	11.7
W.	23	9 39	16 8	10 3	16 11	11 30	14 8	11 53	14 10	0 35	16 11	0 58	17 2	12.7
Th.	24	10 26	17 1	10 48	17 3	—	—	0 15	15 0	1 23	17 5	1 46	17 7	13.7
F.	25	11 10	17 5	11 31	17 6	0 36	15 2	0 57	15 3	2 7	17 10	2 27	18 0	○
S.	26	11 50	17 7	—	—	1 16	15 4	1 34	15 5	2 46	18 2	3 6	18 3	15.7
..	27	0 9	17 7	0 28	17 7	1 52	15 4	2 9	15 4	3 22	18 4	3 38	18 4	16.7
M.	28	0 47	17 7	1 5	17 6	2 26	15 3	2 43	15 3	3 56	18 4	4 12	18 4	17.7
Tu.	29	1 23	17 5	1 41	17 3	2 59	15 2	3 14	15 1	4 30	18 3	4 48	18 2	18.7
W.	30	1 59	17 2	2 18	17 0	3 30	14 11	3 48	14 9	5 3	18 0	5 20	17 11	19.7
Th.	31	2 36	16 9	2 54	16 6	4 6	14 7	4 24	14 4	5 39	17 9	5 56	17 6	20.7
Half Mean Spring Range.		9ft. 4in.				8ft. 0in.				9ft. 7in.				

Equation of Time at Noon.

[illegible]

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 8 m. | LONDON 0 m.

DECEMBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.								
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.											
		H. M.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.													
Tu.	1	4m18	3 11 10 4	3 29 10 2	9 47 17 10	10 8 17 6	6 43 12 1	7																							
W.	2	5 1	3 49 10 0	4 8 9 11	10 30 17 2	10 57 16 10	7 26 11 7	7																							
Th.	3	5 43	4 31 9 10	4 55 9 8	11 25 16 6	11 56 16 3	8 15 11 2	8																							
F.	4	6 26	5 20 9 7	5 49 9 7	—	0 27 16 1	9 13 10 11	9																							
S.	5	7 9	6 21 9 7	6 58 9 8	0 57 16 1	1 28 16 2	10 19 10 11	10																							
S.	6	7 55	7 34 9 9	8 5 9 11	1 59 16 4	2 28 16 8	11 22 11 2	11																							
M.	7	8 44	8 30 10 1	9 6 10 3	2 58 17 2	3 27 17 9	—	0																							
Tu.	8	9 36	9 33 10 6	10 0 10 9	3 54 18 3	4 20 18 10	0 44 12 3	1																							
W.	9	10 32	10 25 11 0	10 48 11 2	4 43 19 4	5 5 19 9	1 35 13 0	2																							
Th.	10	11 32	11 12 11 5	11 35 11 7	5 27 20 2	5 51 20 11	2 24 13 8	2																							
F.	11	0834	11 58 11 8	—	6 15 20 10	6 39 21 1	3 9 14 3	3																							
S.	12	1 35	0 21 11 9	0 45 11 10	7 3 21 4	7 29 21 6	3 55 14 9	4																							
S.	13	2 34	1 10 11 10	1 34 11 9	7 52 21 6	8 15 21 6	4 42 14 10	5																							
M.	14	3 31	1 57 11 11	2 21 11 7	8 39 21 3	9 4 21 0	5 29 14 6	5																							
Tu.	15	4 24	2 46 11 5	3 12 11 4	9 29 20 7	9 54 20 2	6 21 14 0	6																							
W.	16	5 15	3 36 11 2	4 0 10 11	10 20 19 8	10 47 19 11	7 15 13 4	7																							
Th.	17	6 5	4 26 10 9	4 53 10 7	11 19 18 9	11 52 18 3	8 12 12 8	8																							
F.	18	6 54	5 20 10 5	5 48 10 3	—	0 25 17 9	9 11 12 1	9																							
S.	19	7 42	6 20 10 2	6 58 10 2	0 58 17 6	1 30 17 3	10 20 11 8	10																							
S.	20	8 32	7 36 10 2	8 10 10 2	2 2 17 3	2 33 17 4	11 26 11 8	11																							
M.	21	9 22	8 44 10 3	9 17 10 4	3 6 17 7	3 38 17 11	—	0																							
Tu.	22	10 13	9 47 10 6	10 15 10 8	4 8 18 2	4 35 18 6	0 58 12 2	1																							
W.	23	11 4	10 41 10 9	11 5 10 11	4 59 18 9	5 22 19 0	1 52 12 8	2																							
Th.	24	11 54	11 28 11 0	11 49 11 1	5 43 19 2	6 5 19 4	2 40 13 0	3																							
F.	25	morn.	—	0 10 11 1	6 27 19 6	6 47 19 7	3 20 13 3	3																							
S.	26	0 42	0 29 11 1	0 47 11 1	7 6 19 8	7 24 19 8	3 57 13 6	4																							
S.	27	1 29	1 5 11 1	1 23 11 0	7 42 19 8	7 59 19 8	4 32 13 7	4																							
M.	28	2 14	1 40 10 11	1 58 10 11	8 16 19 7	8 32 19 6	5 6 13 5	5																							
Tu.	29	2 57	2 14 10 10	2 31 10 9	8 48 19 4	9 6 19 1	5 39 13 2	5																							
W.	30	3 40	2 48 10 8	3 6 10 7	9 24 18 10	9 43 18 7	6 15 12 9	6																							
Th.	31	4 21	3 24 10 6	3 42 10 4	10 0 18 4	10 19 18 0	6 54 12 5	7																							
Half Mean Spring Range.			5 ft. 9 in.								10 ft. 5 in.								7 ft. 2 in.												
Phases of the Moon.																Moon's Declination at Noon.															
			D.	H.	M.		M.D.	0	'	M.D.	0	'	M.D.	0	'	M.D.	0	'													
Last Quarter			3	0	14	Afternoon.	1	10	N. 50	9	19	8. 50	17	2	N. 22	25															
New			10	8	23	Afternoon.	2	6	57	10	21	1	18	7	8	26															
First Quarter			17	11	46	Morning.	3	2	46	11	20	48	19	11	28	27															
Full			25	2	50	Morning.	4	1	35	12	19	9	20	15	10	28															
							5	5	59	13	16	11	21	18	4	29															
In Perigee			12	5	0	Afternoon.	6	10	14	14	11	15	22	20	2	30															
In Apogee			28	3	0	Afternoon.	7	14	9	15	7	36	23	21	0	31															
							8	17	27	16	2	38	24	20	57																

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

DECEMBER, 1863.

NORTH SHIELDS.								LEITH.								THURSO.								C's AGE AT NOON.
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			
1 6 44 11 0	11 0			7 6 10 9	10 9			5 40 13 10	13 10			6 2 13 6	13 6			11 54 10 4	10 4			—	—			20·2
2 7 29 10 6	10 6			7 55 10 2	10 2			6 24 13 3	13 3			6 49 13 0	13 0			0 16 10 1	10 1			0 41 9 10	9 10			21·2
3 8 22 9 11	9 11			8 52 9 10	9 10			7 17 12 9	12 9			7 46 12 7	12 7			1 7 9 8	9 8			1 37 9 6	9 6			(
4 9 24 9 9	9 9			9 58 9 9	9 9			8 17 12 5	12 5			8 51 12 5	12 5			2 8 9 4	9 4			2 43 9 4	9 4			23·2
5 10 31 9 10	9 10			11 4 10 0	10 0			9 25 12 6	12 6			9 58 12 7	12 7			3 21 9 4	9 4			3 57 9 5	9 5			24·2
6 11 35 10 3	10 3			—	—			10 28 12 10	12 10			10 57 13 1	13 1			4 28 9 7	9 7			4 59 9 9	9 9			25·2
7 0 4 10 6	10 6			0 32 10 9	10 9			11 25 13 5	13 5			11 51 13 9	13 9			5 27 10 1	10 1			5 52 10 6	10 6			26·2
8 0 56 11 1	11 1			1 20 11 5	11 5			—	—			0 14 14 2	14 2			6 15 10 11	10 11			6 35 11 6	11 6			27·2
9 1 42 11 10	11 10			2 4 12 2	12 2			0 36 14 8	14 8			0 59 15 2	15 2			6 56 12 0	12 0			7 15 12 6	12 6			28·2
0 2 26 12 6	12 6			2 47 12 10	12 10			1 22 15 7	15 7			1 44 15 11	15 11			7 34 12 11	12 11			7 55 13 3	13 3			●
1 3 9 13 2	13 2			3 32 13 5	13 5			2 7 16 3	16 3			2 30 16 6	16 6			8 17 13 6	13 6			8 40 13 8	13 8			0·7
2 3 55 13 7	13 7			4 19 13 8	13 8			2 52 16 8	16 8			3 15 16 9	16 9			9 4 13 9	13 9			9 28 13 8	13 8			1·7
3 4 44 13 7	13 7			5 9 13 5	13 5			3 39 16 8	16 8			4 3 16 7	16 7			9 53 13 7	13 7			10 18 13 4	13 4			2·7
4 5 34 13 4	13 4			5 59 13 2	13 2			4 28 16 5	16 5			4 53 16 2	16 2			10 44 13 1	13 1			11 11 12 9	12 9			3·7
5 6 25 12 11	12 11			6 51 12 8	12 8			5 19 15 11	15 11			5 46 15 8	15 8			11 38 12 5	12 5			—	—			4·7
6 7 17 12 4	12 4			7 46 11 11	11 11			6 14 15 3	15 3			6 42 14 10	14 10			0 5 12 0	12 0			0 34 11 8	11 8			5·7
7 8 17 11 6	11 6			8 48 11 2	11 2			7 11 14 5	14 5			7 43 14 1	14 1			1 3 11 4	11 4			1 33 11 0	11 0			6
8 9 21 10 10	10 10			9 57 10 9	10 9			8 15 13 8	13 8			8 49 13 6	13 6			2 6 10 8	10 8			2 41 10 5	10 5			7·7
9 10 32 10 8	10 8			11 6 10 8	10 8			9 26 13 4	13 4			10 1 13 4	13 4			3 21 10 3	10 3			3 59 10 2	10 2			8·7
10 11 39 10 9	10 9			—	—			10 33 13 4	13 4			11 5 13 5	13 5			4 33 10 1	10 1			5 7 10 1	10 1			9·7
11 0 12 10 10	10 10			0 42 10 11	10 11			11 36 13 6	13 6			—	—			5 38 10 2	10 2			6 6 10 5	10 5			10·7
12 1 10 11 0	11 0			1 35 11 2	11 2			0 4 13 9	13 9			0 29 14 0	14 0			6 30 10 9	10 9			6 51 11 1	11 1			11·7
13 1 58 11 5	11 5			2 21 11 8	11 8			0 53 14 3	14 3			1 16 14 7	14 7			7 12 11 5	11 5			7 31 11 9	11 9			12·7
14 2 42 11 10	11 10			3 2 12 0	12 0			1 38 14 10	14 10			1 59 15 0	15 0			7 49 12 0	12 0			8 7 12 3	12 3			13·7
15 3 21 12 2	12 2			3 39 12 4	12 4			2 19 15 2	15 2			2 38 15 4	15 4			8 26 12 4	12 4			8 43 12 4	12 4			○
16 3 58 12 5	12 5			4 16 12 5	12 5			2 55 15 5	15 5			3 12 15 5	15 5			9 0 12 4	12 4			9 17 12 3	12 3			15·7
17 4 33 12 4	12 4			4 52 12 3	12 3			3 29 15 4	15 4			3 46 15 2	15 2			9 36 12 2	12 2			9 54 12 1	12 1			16·7
18 5 9 12 2	12 2			5 26 12 0	12 0			4 4 15 1	15 1			4 21 15 0	15 0			10 11 12 0	12 0			10 28 11 10	11 10			17·7
19 5 43 11 11	11 11			6 1 11 9	11 9			4 38 14 10	14 10			4 55 14 8	14 8			10 46 11 7	11 7			11 5 11 5	11 5			18·7
0 6 19 11 8	11 8			6 37 11 6	11 6			5 13 14 7	14 7			5 32 14 5	14 5			11 25 11 2	11 2			11 44 11 0	11 0			19·7
1 6 56 11 4	11 4			7 16 11 2	11 2			5 52 14 2	14 2			6 13 13 11	13 11			—	—			0 4 10 9	10 9			20·7
Mean Spring } 6ft. 8in. Range.								8ft. 2in.								6ft. 7in.								

Equation of Time at Noon.

M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Sub.
10 52		9	7 33		17	3 45		25	0 13	
10 29		10	7 5		18	3 16		26	0 43	
10 5		11	6 38		19	2 46		27	1 13	
9 41		12	6 10		20	2 16		28	1 42	
9 17		13	5 42		21	1 46		29	2 11	
8 51		14	5 13		22	1 17		30	2 41	
8 26		15	4 44		23	0 47		31	3 9	
7 59		16	4 15		24	0 17				

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

DECEMBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
		H. M.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.							
Tu.	1	4m18	3 6	11	3 25	8 9	2 16	22 2	2 36	21 5	9 26	17 4	9 44	17 6												
W.	2	5 1	3 45	8	4 7	8 7	2 56	21 4	3 18	20 10	10 4	16 7	10 25	16 9												
Th.	3	5 43	4 30	8 6	4 55	8 5	3 43	20 5	4 11	20 1	10 46	15 9	11 10	15 5												
F.	4	6 26	5 23	8 4	5 53	8 3	4 41	19 10	5 15	19 10	11 38	15 4	—	—												
S.	5	7 9	6 26	8 2	6 59	8 2	5 51	19 11	6 29	20 2	0 8	15 4	0 41	15 6												
S.	6	7 55	7 31	8 3	8 4	8 5	7 1	20 6	7 32	21 0	1 17	15 8	1 53	16 1												
M.	7	8 44	8 34	8 7	9 3	8 9	8 3	21 7	8 28	22 3	2 26	16	2 57	17 3												
Tu.	8	9 36	9 30	11	9 55	9 1	8 52	23 0	9 16	23 8	3 26	18	3 54	18 8												
W.	9	10 32	10 19	9 3	10 44	9 4	9 39	24 4	10 1	24 10	4 21	19 3	4 47	19 10												
Th.	10	11 32	11 9	9 6	11 34	9 7	10 23	25 4	10 46	25 9	5 13	20 4	5 38	20 9												
F.	11	0 34	11 59	9 9	—	—	11 10	26 3	11 35	26 7	6 3	21 2	6 27	21 6												
S.	12	1 35	0 24	9 10	0 49	9 11	12 0	26 9	—	—	6 51	21 8	7 14	21 9												
S.	13	2 34	1 14	10 0	1 38	10 0	0 24	26 10	0 48	26 9	7 38	21 8	8 2	21 6												
M.	14	3 31	2 1	10 0	2 25	9 11	1 11	26 6	1 35	26 1	8 26	21 2	8 51	20 10												
Tu.	15	4 24	2 49	9 10	3 13	9 8	2 0	25 8	2 24	25 1	9 15	20 4	9 39	19 9												
W.	16	5 15	3 37	9 6	4 3	9 5	2 48	24 6	3 13	23 11	10 2	19 3	10 26	18 9												
Th.	17	6 5	4 29	9	4 55	9 1	3 40	23 3	4 9	22 7	10 49	18 1	11 13	17 5												
F.	18	6 54	5 23	8 11	5 54	8 9	4 39	21 11	5 13	21 7	11 39	17 0	—	—												
S.	19	7 42	6 27	8 7	7 1	8 6	5 51	21 4	6 31	21 3	0 10	16 8	0 43	16 6												
S.	20	8 32	7 35	8 6	8 11	8 7	7 6	21 4	7 40	21 7	1 21	16 5	2 12	16 7												
M.	21	9 22	8 45	8	9 17	8 9	8 14	21 10	8 42	22 2	2 38	16 10	3 12	17 2												
Tu.	22	10 13	9 45	8 10	10 12	8 11	9 8	22 7	9 32	23 0	3 42	17	4 11	18 1												
W.	23	11 4	10 36	11	11 0	9 0	9 55	23 4	10 17	23 7	4 38	18 5	5 3	18 9												
Th.	24	11 54	11 23	9 1	11 45	9 1	10 38	23 10	10 58	24 0	5 28	19 0	5 50	19 9												
F.	25	morn.	—	—	0 6	9 2	11 18	24 3	11 37	24 5	6 10	19 5	6 28	19 7												
S.	26	0 42	0 26	9 3	0 44	9 3	11 56	24 5	—	—	6 47	19 8	7 4	19 8												
S.	27	1 29	1 2	9 4	1 20	9 4	0 14	24 6	0 32	24 5	7 21	19 7	7 38	19 6												
M.	28	2 14	1 38	9 4	1 54	9 4	0 49	24 4	1 5	24 3	7 54	19 5	8 11	19 5												
Tu.	29	2 57	2 10	9 4	2 27	9 3	1 21	24 0	1 37	23 8	8 28	19 0	8 46	18 10												
W.	30	3 40	2 44	9 2	3 2	9 1	1 54	23 5	2 12	23 1	9 4	18 7	9 21	18 5												
Th.	31	4 21	3 19	9 0	3 36	8 11	2 30	22 9	2 47	22 5	9 38	17 11	9 55	17 7												
Half Mean Spring Range.			4 ^{ft.} 10 ^{in.}				13 ^{ft.} 0 ^{in.}				10 ^{ft.} 6 ^{in.}															
Phases of the Moon.											Moon's Declination at Noon.															
D H. M.											M.D.	0	1	M.D.	0	1	M.D.	0	1	0	1					
Last Quarter - 3 0 14 Afternoon.											1	10	N. 50	9	19	8. 50	17	2N. 22	25	19N. 55						
New - - - - - 10 8 23 Afternoon.											2	6	57	10	21	1	18	7	8	26	17 59					
First Quarter - 17 11 46 Morning.											3	2	46	11	20	48	19	11	28	27	15 19					
Full - - - - - 25 2 50 Morning.											4	18	35	12	19	9	20	15	10	28	12					
											5	5	59	13	16	12	21	18	4	29	8 17					
In Perigee - - 12 5 0 Afternoon.											6	10	14	14	12	15	22	20	2	30	4 13					
In Apogee - - 28 3 0 Afternoon.											7	14	9	15	7	36	23	21	0	31	0 2					
											8	17	27	16	2	38	24	20	57							

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 Greenock add 19 m. | Liverpool add 12 m. | Pembroke add 20 m.

DECEMBER, 1863.

WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.				D.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. 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Equation of Time at Noon.

M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Sub.
10 52		9	7 33		17	3 45		25	0 13	
10 29		10	7 5		18	3 16		26	0 43	
10 5		11	6 38		19	2 46		27	1 13	
9 41		12	6 10		20	2 16		28	1 42	
9 17		13	5 42		21	1 46		29	2 11	
8 51		14	5 13		22	1 17		30	2 41	
8 26		15	4 44		23	0 47		31	3 9	
7 59		16	4 15		24	0 17				

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

DECEMBER, 1863.

WEEK DAY.	MONTH DAY.	MOON'S TRAMIT.	BELFAST.						LONDONDERRY.						SLIGO BAY.																										
			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.																							
			Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.																						
		H. M.	H. M.	F. I.	H. M.	F. I.		H. M.	F. I.		H. M.	F. I.		H. M.	F. I.		H. M.	F. I.																							
Tu.	1	4m18	1 55	8 7		2 18	8 6	11 19	6 0	11 46	5 9	8 37	8 10	9 1	8 1																										
W.	2	5 1	2 41	8 5		3 4	8 3	—	—	0 18	5 7	9 28	8 6	9 57	8 4																										
Th.	3	5 43	3 30	8 2		3 58	8 1	0 50	5 6	1 24	5 5	10 27	8 3	10 59	8 1																										
F.	4	6 26	4 28	8 1		4 58	8 0	2 0	5 5	2 35	5 6	11 31	8 3	—	—																										
S.	5	7 9	5 30	8 0		6 2	8 0	3 8	5 8	3 38	5 11	0 3	8 3	0 36	8 1																										
S.	6	7 55	6 33	8 1		7 4	8 2	4 5	6 1	4 30	6 3	1 7	8 6	1 37	8 1																										
M.	7	8 44	7 33	8 3		7 59	8 5	4 53	6 5	5 14	6 7	2 6	8 11	2 31	9 1																										
Tu.	8	9 36	8 23	8 8		8 46	8 11	5 34	6 10	5 56	7 0	2 54	9 7	3 15	9 1																										
W.	9	10 32	9 9	9 1		9 31	9 3	6 19	7 2	6 43	7 4	3 36	10 3	3 57	10 1																										
Th.	10	11 32	9 54	9 4		10 16	9 5	7 6	7 6	7 30	7 8	4 20	10 11	4 44	11 1																										
F.	11	0 34	10 39	9 6		11 2	9 7	7 53	7 10	8 15	7 11	5 8	11 4	5 32	11 1																										
S.	12	1 35	11 25	9 7		11 48	9 7	8 37	8 0	8 59	7 11	5 55	11 7	6 18	11 1																										
S.	13	2 34	—	—		0 13	9 7	9 22	7 10	9 44	7 8	6 42	11 5	7 7	11 1																										
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Tu.	15	4 24	1 32	9 5		2 0	9 3	10 58	7 2	11 29	6 11	8 21	10 4	8 48	10 1																										
W.	16	5 15	2 29	9 1		2 57	8 11	—	—	0 3	6 8	9 18	9 9	9 50	9 1																										
Th.	17	6 5	3 26	8 10		3 56	8 8	0 40	6 5	1 17	6 2	10 23	9 3	10 56	9 1																										
F.	18	6 54	4 26	8 6		4 59	8 5	1 55	6 1	2 34	6 1	11 30	9 0	—	—																										
S.	19	7 42	5 32	8 4		6 5	8 3	3 9	6 2	3 41	6 3	0 4	8 11	0 38	8 11																										
S.	20	8 32	6 38	8 3		7 12	8 3	4 9	6 5	4 37	6 6	1 11	8 10	1 45	8 11																										
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S.	27	1 29	11 55	8 1		—	—	9 6	7 1	9 22	7 0	6 25	10 5	6 42	10 4																										
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Th.	31	4 21	2 7	8 9		2 28	8 8	11 29	6 2	11 54	6 0	8 47	9 1	9 9	8 11																										
Half Mean Spring } Range.			4ft. 9in.						3ft. 10in.						5ft. 7in.																										
Phases of the Moon.																					Moon's Declination at Noon.																				
D. H. M.																					M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter - 3 0 14 Afternoon.																					1	10	N. 50	9	19	S. 50	17	2	N. 22	25	19	N. 5									
New - - - - 10 8 23 Afternoon.																					2	6	57	10	21	1	18	7	8	26	17	5									
First Quarter - 17 11 46 Morning.																					3	2	46	11	20	48	19	11	28	27	15	10									
Full - - - - 25 2 50 Morning.																					4	1	S. 35	12	19	9	20	15	10	28	12	1									
																					5	5	59	13	16	12	21	18	4	29	8	1									
In Perigee - - 12 5 0 Afternoon.																					6	10	14	14	12	15	22	20	2	30	4	1									
In Apogee - - 28 3 0 Afternoon.																					7	14	9	15	7	36	23	21	0	31	0	S. 1									
																					8	17	27	16	2	38	24	20	57												

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—

BELFAST subtract 3 m.

LONDONDERRY add 4 m.

SLIGO BAY add 3 m.

DECEMBER, 1863.

GALWAY.						QUEENSTOWN.						WATERFORD.						C's AGE AT NOON.
MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			
Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		
H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.	D.	
8 0 11 11	8 21 11 7		8 16 9 11	8 35 9 8		8 33 10 11	8 51 10 9	20.2										
8 44 11 3	9 9 10 11		8 56 9 6	9 17 9 4		9 10 10 6	9 33 10 4	21.2										
9 37 10 9	10 7 10 7		9 40 9 2	10 7 9 1		10 0 10 1	10 29 9 11	(
10 39 10 8	11 13 10 9		10 38 9 0	11 11 9 0		10 59 9 10	11 30 9 9	23.2										
11 48 10 11	— —		11 45 9 1	— —		12 0 9 10	— —	24.2										
1 19 11 1	0 49 11 5		0 18 9 3	0 50 9 5		0 30 10 0	1 0 10 2	25.2										
1 17 11 9	1 42 12 2		1 23 9 8	1 53 9 11		1 31 10 4	2 3 10 8	26.2										
2 6 12 8	2 30 13 1		2 22 10 2	2 48 10 6		2 33 11 0	3 2 11 4	27.2										
2 54 13 6	3 17 13 10		3 13 10 10	3 38 11 1		3 31 11 7	3 58 11 10	28.2										
3 40 14 3	4 3 14 7		4 2 11 5	4 26 11 8		4 24 12 1	4 49 12 4	●										
4 26 14 11	4 49 15 2		4 51 11 10	5 16 12 0		5 14 12 6	5 37 12 8	0.7										
5 14 15 4	5 39 15 4		5 41 12 1	6 6 12 2		6 2 12 9	6 26 12 10	1.7										
5 4 15 3	6 28 15 2		6 30 12 1	6 54 12 0		6 50 12 10	7 14 12 9	2.7										
5 53 14 11	7 19 14 7		7 18 11 10	7 42 11 8		7 38 12 8	8 2 12 7	3.7										
6 45 14 3	8 12 13 9		8 6 11 5	8 29 11 2		8 25 12 5	8 47 12 2	4.7										
6 39 13 3	9 7 12 10		8 53 10 11	9 18 10 7		9 9 11 10	9 32 11 7	5.7										
6 35 12 5	10 5 12 0		9 42 10 3	10 7 10 0		9 58 11 3	10 28 10 11)										
6 39 11 10	11 14 11 8		10 38 9 10	11 12 9 8		11 0 10 8	11 32 10 6	7.7										
7 50 11 8	— —		11 47 9 7	— —		— —	0 4 10 4	8.7										
7 24 11 8	0 57 11 9		0 22 9 7	0 58 9 8		0 35 10 4	1 8 10 4	9.7										
7 28 11 11	1 55 12 1		1 35 9 9	2 8 9 10		1 43 10 6	2 18 10 8	10.7										
7 21 12 4	2 47 12 7		2 37 10 0	3 5 10 3		2 50 10 10	3 20 11 0	11.7										
7 11 12 10	3 33 13 0		3 30 10 5	3 54 10 7		3 48 11 2	4 14 11 4	12.7										
7 54 13 3	4 15 13 5		4 17 10 9	4 38 10 10		4 39 11 5	5 1 11 6	13.7										
7 34 13 7	4 52 13 9		4 58 11 0	5 18 11 1		5 21 11 7	5 39 11 8	○										
7 10 13 10	5 28 13 10		5 37 11 1	5 55 11 1		5 57 11 9	6 15 11 9	15.7										
7 46 13 9	6 4 13 8		6 13 11 1	6 30 11 1		6 34 11 9	6 51 11 9	16.7										
7 20 13 7	6 37 13 5		6 46 11 0	7 3 10 11		7 8 11 9	7 24 11 9	17.7										
7 55 13 3	7 13 13 1		7 19 10 9	7 37 10 7		7 40 11 8	7 57 11 7	18.7										
7 32 12 11	7 51 12 8		7 55 10 6	8 12 10 4		8 14 11 6	8 30 11 4	19.7										
7 11 12 5	8 31 12 1		8 28 10 2	8 45 10 0		8 46 11 2	9 2 11 0	20.7										
In Spring } 7ft. 5in.						5ft. 10in.						6ft. 2in.						

Equation of Time at Noon.

M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Sub.
0 52		9	7 33		17	3 45		25	0 13	
0 29		10	7 5		18	3 16		26	0 43	
0 5		11	6 38		19	2 46		27	1 13	
9 41		12	6 10		20	2 16		28	1 42	
9 17		13	5 42		21	1 46		29	2 11	
8 51		14	5 13		22	1 17		30	2 41	
8 26		15	4 44		23	0 47		31	3 9	
7 59		16	4 15		24	0 17				

of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
WAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

TABLE (B.)—For finding the Height of the Tide at any intermediate Hour between High and Low Water.

Height above Half-tide or Mean Level of the Sea.	Time from High Water.													
	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
	0 00	0 30	1 0	1 30	2 0	2 30	3 0	3 30	4 0	4 30	5 0	5 30	6 0	6 30
	Add							Subtract						
Feet.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
3	3 0	2 11	2 7	2 1	1 6	0 9	0 0	0 9	1 6	2 1	2 7	2 11	3 0	3 6
4	4 0	3 10	3 6	2 10	2 0	1 0	0 0	1 0	2 0	2 10	3 6	3 10	4 0	4 6
5	5 0	4 10	4 4	3 6	2 6	1 3	0 0	1 3	2 6	3 6	4 4	4 10	5 0	5 6
6	6 0	5 10	5 2	4 3	3 0	1 7	0 0	1 7	3 0	4 3	5 2	5 10	6 0	6 6
7	7 0	6 9	6 1	4 11	3 6	1 10	0 0	1 10	3 6	4 11	6 1	6 9	7 0	7 6
8	8 0	7 9	6 11	5 8	4 0	2 1	0 0	2 1	4 0	5 8	6 11	7 9	8 0	8 6
9	9 0	8 8	7 9	6 4	4 6	2 4	0 0	2 4	4 6	6 4	7 9	8 8	9 0	9 6
10	10 0	9 8	8 8	7 1	5 0	2 7	0 0	2 7	5 0	7 1	8 8	9 8	10 0	10 6
11	11 0	10 8	9 6	7 9	5 6	2 10	0 0	2 10	5 6	7 9	9 6	10 8	11 0	11 6
12	12 0	11 7	10 5	8 6	6 0	3 1	0 0	3 1	6 0	8 6	10 5	11 7	12 0	12 6
13	13 0	12 7	11 3	9 2	6 6	3 4	0 0	3 4	6 6	9 2	11 3	12 7	13 0	13 6
14	14 0	13 6	12 1	9 11	7 0	3 7	0 0	3 7	7 0	9 11	12 1	13 6	14 0	14 6
15	15 0	14 6	13 0	10 7	7 6	3 11	0 0	3 11	7 6	10 7	13 0	14 6	15 0	15 6
16	16 0	15 5	13 10	11 4	8 0	4 2	0 0	4 2	8 0	11 4	13 10	15 5	16 0	16 6
17	17 0	16 5	14 9	12 0	8 6	4 5	0 0	4 5	8 6	12 0	14 9	16 5	17 0	17 6
18	18 0	17 5	15 7	12 9	9 0	4 8	0 0	4 8	9 0	12 9	15 7	17 5	18 0	18 6
19	19 0	18 4	16 5	13 5	9 6	4 11	0 0	4 11	9 6	13 5	16 5	18 4	19 0	19 6
20	20 0	19 4	17 4	14 2	10 0	5 2	0 0	5 2	10 0	14 2	17 4	19 4	20 0	20 6
21	21 0	20 3	18 2	14 10	10 6	5 5	0 0	5 5	10 6	14 10	18 2	20 3	21 0	21 6
22	22 0	21 3	19 1	15 7	11 0	5 8	0 0	5 8	11 0	15 7	19 1	21 3	22 0	22 6
23	23 0	22 3	19 11	16 3	11 6	5 11	0 0	5 11	11 6	16 3	19 11	22 3	23 0	23 6
24	24 0	23 2	20 9	17 0	12 0	6 2	0 0	6 2	12 0	17 0	20 9	23 2	24 0	24 6

RULE.—To find the Height of the Tide above the zero of the tables at any intermediate Hour between *High and Low Water*.*

The zero of the tables is the mean height of the low water of ordinary spring tides.

From the height in the tables, subtract the half mean spring range, the remainder will be the height above the half-tide or mean level

* The mean interval of time between two consecutive high waters is about 12h. 25m., but for the mariner's purpose the duration of flood or ebb may be considered as 6 hours. There are occasional exceptions ; at Portsmouth, for example, the flood runs 7 hours and the ebb 5 hours.

of the sea, with which enter Table (B.), and, under the time from high water, take out the corresponding correction, and, as directed, add it to, or subtract it from, the half mean spring range; the result will be the height of the tide at that time above zero or the low-water standard of the tables.

EXAMPLE I.

Required the height of the tide above zero at Liverpool on March 12th, P.M., at 2 h. after high water.

	Ft.	in.
Height of high water (by the tables) - - -	22	0
Half mean spring range - - -	13	0
<hr/>		
Height above the half-tide or mean level of the sea - =	9	0
Half mean spring range - - -	13	0
By table (B) 9 ft. 0 in. gives - - - +	4	6
<hr/>		
Height of the tide above zero at 2 h. after high water =	17	6

EXAMPLE II.

Required the height of the tide above zero, at Liverpool on March 20th, P.M., at 4 h. after high water.

	Ft.	in.
Height of high water (by the tables) . . -	27	4
Half mean spring range - - -	13	0
<hr/>		
Height above the half-tide or mean level of the sea -	14	4
Half mean spring range - - -	13	0
By table (B) 14 ft. 4 in. gives - - - —	7	2
<hr/>		
Height of the tide above zero at 4 h. after high water =	5	10

In some cases, however, between 5 and 6 h. from high water, the correction from table (B) will be greater than the half mean spring range; when such is the case, the tide at that time will have fallen *below* the zero of the tables by a quantity equal to the difference between the correction from table (B) and the half mean spring range.

EXAMPLE III.

Required the level of the tide at Liverpool on March 20th, P.M. at $5\frac{1}{2}$ h. after high water.

	Ft.	in.
Height of high water (by the tables) - - -	27	4
Half mean spring range - - -	13	0
<hr/>		
Height above the half tide or mean level of the sea -	14	4
Half mean spring range - - -	13	0
By table (B) 14 ft. 4 in. at $5\frac{1}{2}$ h. from high water -	13	10
<hr/>		
Level of the tide <i>below</i> zero - - -	0	10

As stated in the advertisement, the soundings in most charts are reduced to the same zero as these tables,—viz., the mean level of the low water of ordinary spring tides,—but should the soundings on any particular chart be reduced to a standard below that zero, there will, in that case, be a greater depth of water in the channel than is given in the tables, by a quantity equal to the difference between the half mean spring range and the half spring range of the chart, or in other words, the difference between the mean level of the low water of spring tides, and the low-water standard to which the soundings on the chart are reduced : for example—The soundings on the chart of Liverpool are reduced to a zero 15 ft. below the mean level of the sea, whereas, the mean spring range for that place, as shown in the result of two years' observations (1854 and 1855) of the Self-registering Tide Gauge at St. Georges Pier, being 26 ft. gives 13 ft. below the mean level of the sea ; consequently 2 ft. will have to be added to the results deduced from table (B.)

Thus, in Example I. On the chart of Liverpool 11 ft. being marked on the bar of the Victoria Channel, the actual depth over the bar at 2h. after high water would be 17 ft. 6 in. + 11 ft. 0 in. + 2 ft. 0 in. = 30 ft. 6 in.

CORRECTIONS FOR CERTAIN DOCKS, &c.*

The depth at high water on the sills of the following Docks may be known, by applying to the standard high water heights given in the foregoing Tables the annexed correction according to the sign.

				Ft.	in
<i>Falmouth</i>	Over the Sill of Graving Dock	-	-	2	0
	(applied to the heights given for Holyhead.)				
<i>Devonport</i>	Over the Sill of Basin	-	-	+15	8
<i>H. M. Dockyard.</i>	„ South Dock	-	-	+12	8
	„ New Long Dock	-	-	+16	1
	„ Old North Dock	-	-	+4	5
	„ New North Dock	-	-	+4	8
„ <i>Keyham</i>	„ Entrance to Lock	-	-	+18	2
	„ Entrance to North Basin	-	-	+9	2
	„ No. 1 Dock	-	-	+5	2
	„ 2 „	-	-	+5	2
	„ 3 „	-	-	+9	2
<i>Plymouth</i>	Great Western Docks, Millbay.				
	Over the Sill of Floating Dock	-	-	+10	3
	„ Graving Dock	-	-	+11	9
	(applied to the heights given for Devonport.)				
<i>Portsmouth</i>	Over the Sill of No. 1 or South Dock	-	-	+6	8
<i>H. M. Dockyard.</i>	„ Entrance			+13	4
	„ No. 2			+10	4
	„ 3			+12	5
	„ 4			+13	0
	„ 5			+6	10

* As it is desirable that the information here given should be accurate and complete, it is requested that corrections and additions be forwarded to the Secretary of the Admiralty.

Portsmouth —Over the Sill of No. 6 or North Dock	-	+ 6	4
H. M. Dockyard. „ Entrance	} Steam Basin	+ 12	2
„ „ No. 7		+ 12	2
„ „ 8		+ 9	1
„ „ 9 at N. end of Slips		+ 8	1
„ „ 10 South „		+ 14	2
Sheerness —Over the Invert at the	} Great Basin -	+ 9	8
H. M. Dockyard. entrance -		+ 9	2
„ Sill of No. 1 Dock		+ 9	2
„ „ 2 „		+ 9	2
„ „ 3 „		+ 9	2
„ „ No. 4 Dock	} Boat Basin -	+ 3	10
„ „ 5 „		- 1	4
Chatham —Over the Sill of No. 1 Dock	-	- 3	11
H. M. Dockyard. „ 2 „	-	+ 3	5
„ 3 „	-	+ 3	4
„ 4 „	-	+ 0	5
(applied to the Heights given for London.)			
Woolwich —Over the Sill at the entrance of Outer Basin	-	+ 3	7
H. M. Dockyard. „ Inner Basin	-	+ 1	10
„ „ No. 1 Dock	-	+ 2	10
„ „ 2 „	-	+ 1	10
„ „ 3 „	-	+ 1	10
(applied to the heights given for London.)			
Deptford —Over the Sill of Outer Dock	-	- 4	2
H. M. Dockyard. „ Inner Dock	-	- 6	2
(applied to the Heights given for London.)			
London —Over the Sill of St. Katherine Dock	-	+ 8	9
„ „ London Dock, Hermitage Entr.	-	+ 0	10
„ „ „ Wapping „	-	+ 3	9
„ „ „ Shadwell, Upper	-	+ 6	2
„ „ „ „ Lower	-	+ 8	10
„ „ Grand Surrey Dock	-	+ 7	10
„ „ Surrey Canal and Dock	-	- 0	2
„ „ New Commercial Dock, Upper	} Entrance	- 1	3
„ „ „		- 0	8
„ „ Regents Canal and Dock	-	- 0	8
„ „ West India Dock, Limehouse	} Entrance	+ 3	10
„ „ „		+ 4	4
„ „ City Canal or South West India Dock, Limehouse	} Commercial Dock, Upper, Limehouse Reach	- 0	8
„ „ „		+ 7	10
„ „ „ „ Lower „	-	+ 7	10
„ „ City Canal or „ South West India Dock, Blackwall	} West India Dock, Blackwall	+ 4	7
„ „ „		+ 3	11
„ „ East India Dock	-	+ 5	4
„ „ Victoria London Dock „	-	+ 8	10
Hull —Over the Sill of Humber Dock	-	+ 4	3
Middlesbrough —Over the Sill of the Dock	-	+ 4	1
(applied to the Heights given for Sunderland.)			
Hartlepool —Over the Sills of Victoria, West or Coal Dock,	} Swainston and Jackson Docks	+ 6	8
„ „ „		-	-
(applied to the Heights given for Sunderland.)			

<i>Sunderland</i> —Over the Sill of Wearmouth Dock	-	-
„ South Dock, North Entrance	-	-
„ „ South Outlet,	}	-
Inner Gates		-
„ „ Outer „	-	-
„ Graving Dock	-	-
<i>Leith</i> — Over the Sills of East and West Docks	-	-
„ Victoria or New Dock	-	-
<i>Pembroke</i> —Over the Sill of Dock Entrance	-	-
<i>H. M. Dockyard.</i>		
<i>Liverpool</i> —		
Over the Sill of Canada Dock, South Passages, East	-	-
„ „ „ West	-	-
„ „ Lock	-	-
„ Huskisson Dock, East Lock	-	-
„ „ West „	-	-
„ Sandon Dock, West Entrance	-	-
„ Wellington Half-tide Dock, East Entrance	-	-
„ „ „ West „	-	-
„ Wellington Dock, West Passage	-	-
„ Bramley-Moore Dock, North Passage	-	-
„ „ South Passage	-	-
„ Nelson Dock, South Passage	-	-
„ Stanley Dock, West Passage	-	-
„ Collingwood Dock, West Passage	-	-
„ Salisbury Dock, West Entrances, North	-	-
„ „ South	-	-
„ Clarence Graving Dock Basin, N. Passage	-	-
„ „ S. Passage	-	-
„ Clarence Half-tide Dock, West Entrance	-	-
„ „ Dock, West Passage	-	-
„ Trafalgar Lock, North and South Passages	-	-
„ „ Dock, South Passage	-	-
„ Victoria Dock, South Passage	-	-
„ Waterloo Dock and Lock, North Passage	-	-
„ „ South Entrance	-	-
„ Princes Dock and Locks, North Entrance	-	-
„ „ South Entrance	-	-
„ Georges Dock and Passage, North Entrance	-	-
„ „ South Passage	-	-
„ Manchester Dock, West Entrance	-	-
„ „ Lock, West Entrance	-	-
„ Canning Dock, West Passage	-	-
„ „ Half-tide Basin, two West En-	}	-
trances, each		-
„ Albert Dock, North Passage	-	-
„ „ East Passage	-	-
„ Salthouse Dock, North Passage	-	-
„ Wapping Basin, West Passage	-	-
„ „ North and South Passages,	}	-
each		-
„ „ Dock, West Passage	-	-
„ „ South Passage	-	-
„ Kings Dock, South Passage	-	-
„ Queens Dock Basin, West Entrances, North	-	-
„ „ South	-	-
„ „ West Passage	-	-
„ „ South Passage	-	-
„ Coburg Dock, West Entrance	-	-

Liverpool—continued :

Ft. in.

Over the Sill of Brunswick Dock, North Passage	-	-	-	1	9
„ „ Half-tide Dock, East Passage	-	-	-	2	9
„ „ „ „ West Entrance	-	-	-	2	3
„ Toxteth Dock, West Entrance	-	-	-	3	3
„ Harrington Dock, West Entrance	-	-	-	7	1
„ Garston Dock	-	-	-	2	3
„ River Craft Dock, Lock, and Eagle Basin,	}	-	-	8	6
Outer Gates					
„ „ „ „ Inner „	-	-	-	9	6
„ Duke of Bridgewater's Dock, Outer Gates	-	-	-	3	9
„ „ „ „ Middle „	-	-	-	8	9
„ „ „ „ Inner „	-	-	-	2	3
„ Canada Lock and Graving Dock	-	-	-	0	6
„ Huskisson Lock and Graving Dock	-	-	-	1	9
„ Sandon Graving Docks, Nos. 1 to 5, East	-	-	-	4	9
„ „ „ „ No. 6, West	-	-	-	4	9
„ Canning Graving Docks, No. 1	-	-	-	10	0
„ „ „ „ No. 2	-	-	-	8	3
„ Queens Graving Docks, No. 1	-	-	-	6	7
„ „ „ „ No. 2	-	-	-	4	9
„ Brunswick Graving Docks, No. 1	-	-	-	5	9
„ „ „ „ No. 2	-	-	-	5	9

Birkenhead—

Over the Sill of Morpeth Dock from Morpeth Basin	-	-	-	3	3
„ Sills of Caisson between Egerton and Morpeth	}	-	-	0	9
Docks					
„ Sill of Reverse Gate	-	-	-	2	9
„ Sills of Caisson between Egerton Dock and Great	}	-	-	0	9
Float					
„ „ East and West Floats	-	-	-	0	9
(applied to the heights given for Liverpool.)					

Dublin—

Over the Sill of North Wall Graving Dock	-	-	+	6	0
„ Old Custom House Dock	-	-	+	3	5
„ Georges Dock	-	-	+	5	5
„ Camden Lock of Grand Canal Dock	-	-	+	7	0
(applied to the heights given for Kingstown.)					

Londonderry—

Over the Sill of Graving Dock	-	-	-	+	7	4
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TIDAL CONSTANTS

FOR

VARIOUS BRITISH, IRISH, AND EUROPEAN PORTS.

THE following table contains Tidal Constants for several places on the coasts of the United Kingdom and of Europe, which, being applied according to the sign + or - to the times or heights belonging to the standard port to which each of them is referred, will afford a ready means of determining approximately the height as well as the time of high water at each of those several places.

[NOTE.] In the tables from 1850-1858 the Constants for the height were given for such places only where the curves for the place and the standard port were similar, the Constant being the difference between the whole rise at the two places. But as that arrangement, which at times referred necessarily to a standard port on a distant part of the coast, appears to have confused the mariner, he is now referred to the standard port in the locality of the required place, which although the result deduced thereby may not be strictly accurate, yet it is sufficiently near for practical purposes.

COAST OF IRELAND.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Skull	— 0 59	— 2 1	Queenstown.
Crookhaven	— 0 52	..	"
Dunmanus Harbour	— 1 4	— 2 4	"
Dunbeacon, Dunmanus Bay	— 1 10	— 1 7	"
Black Ball Harbour	— 1 21	— 2 3	"
Castletown, Bearhaven	— 0 47	— 2 0	"
Bantry Harbour	— 1 14	— 1 7	"
West Cove, Kenmare River	— 1 9	— 1 9	"
Valentia Harbour	— 1 19	— 0 8	"
Limerick, R. Shannon	+ 1 45	+ 1 9	Galway.
Mellon	+ 1 26	..	"
Foynes Island	+ 1 0	+ 0 7	"
Tarbert	+ 0 22	— 0 7	"
Kilrush	+ 0 7	..	"
Carrigaholt	+ 0 9	..	"
Kilbaha	— 0 19	— 1 9	"
Roundstone	— 0 50	+ 1 9	Sligo.
Inishbofin	— 0 44	+ 0 4	"
Westport	— 0 21	+ 1 1	"
Achillbeg	— 0 4	— 0 6	"
Blacksod Bay (Quay)	— 0 31	..	"
Broadhaven Harbour	— 0 18	— 0 9	"
Donegal Harbour, (Salthill Quay)	+ 0 5	..	"
Killybegs	+ 0 13	..	"
Lough Rossmore	+ 0 19	..	"
Gweedore Bay (Bunbeg)	+ 0 14	— 0 6	"
Sheephaven	+ 0 7	+ 0 7	"
Rathmullan, Lough Swilly	+ 0 24	..	"
Coleraine	— 1 37	— 1 6	Londonderry.
Port Rush	— 1 53	— 2 6	"
Ballycastle Bay	— 4 18	..	Belfast.
Lough Larne	— 0 13	..	"
Donaghadee	+ 0 3	+ 0 3	Kingstown.
Lough Strangford (Killard Point)	— 0 17	..	"
" Strangford Quay	+ 1 21	..	"
" Carlingford (Bar or Cranfield Point)	— 0 10	..	"
Warrenpoint	0 0	+ 3 1	"
Howth	— 0 1	..	"
Dublin Bar	+ 0 2	..	"
Wicklow	— 0 41	..	"
Arklow	— 2 25	..	"
Wexford	+ 2 1	— 7 4	Waterford.
New Ross	+ 0 44	+ 0 1	"
Waterford Bridge	+ 0 46	+ 1 0	"
Dunmore	+ 0 7	— 0 2	"
Ballinacourty, Dungarvan	— 0 8	0 0	"
Youghal	— 0 6	+ 0 3	"
Ballycotton	— 0 26	— 0 5	"
Kinsale	— 0 18	— 0 4	Queenstown.
Courtmacsherry	— 0 25	— 1 1	"
Castletownsend	— 0 40	— 1 0	"
Baltimore	— 0 38	..	"

THE GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
S	— 2 10	..	Weston-super-mare.
W	— 1 41	..	"
Island	— 1 39	..	"
Apple Bar	— 1 24	..	"
Ambe	— 1 12	..	"
Water Bar	— 0 4	..	"
Head	+ 0 22	..	"
l (King Road)	+ 0 2	..	"
F	+ 0 5	..	"
ea (Mumbles Lighthouse)	— 0 11	..	Pembroke.
ly	+ 0 4	..	"
.	— 0 12	..	"
d Haven (entrance)	— 0 20	..	"
ard, Goodic Pier	+ 3 15	— 4 5	Holyhead.
an	— 3 10	..	"
stwyth	— 2 40	— 3 0	"
ovey	— 2 11	..	"
uth	— 2 31	..	"
li	— 2 25	..	"
ey Island	— 2 31	..	"
dyn-lleyn	— 1 41	..	"
arvon	— 0 38	— 2 3	"
aris	— 0 51	— 4 7	Liverpool.
etwood (Wyre Lighthouse)	— 0 12	..	"
n-le-Sands	+ 0 3	+ 1 3	"
haven	— 0 9	— 2 9	"
es Head and Port Har- } ton	— 0 18	..	"
ington	— 0 19	..	"
ort	— 0 20	..	"
r Head	— 0 13	..	"
erness	— 0 3	..	"
1 Foot	+ 0 33	..	"
Carlisle	+ 0 47	..	"
as, Isle of Man	+ 1 1	..	Holyhead.
ey "	+ 1 1	+ 3 3	"
" "	+ 0 57	+ 0 3	"
Point, Solway Firth	— 0 1	— 2 11	Liverpool.
Patrick	— 0 58	..	Greenock.
Ryan	— 0 56	..	"
ish	— 0 19	..	"
bellton	— 0 23	..	"
.	— 0 18	— 1 0	"
ssan	— 0 23	..	"
.	— 0 18	..	"
ry	— 0 2	..	"
Glasgow	+ 0 10	..	"
ow	+ 1 17	..	"
.	+ 4 41	..	"
mory, Isle of Mull	— 2 52	..	Tarboro.
ie, Isle of Skye	— 1 56	..	"
Inver	— 1 47	..	"
Akin	— 2 12	..	"
a, Summer Isles	— 1 51	..	"
oway, Isle of Lewis	— 1 42	..	"
Wrath	— 0 58	..	"

PORTS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Stromness	+ 0 32	..	Thurso.
Lerwick	+ 2 2	..	"
Wick	- 2 55	..	Leith.
Dornock Road	- 2 17	..	"
Cromarty	- 2 21	..	"
Inverness	- 1 59	..	"
Banff	- 1 49	..	"
Peterhead	- 1 43	..	"
Aberdeen	- 1 17	..	"
Stonehaven	- 1 7	..	"
Montrose	- 0 52	..	"
Arbroath	- 0 42	..	"
Tay Bar	- 0 11	..	"
Broughty Ferry	+ 0 5	..	"
Dundee	- 0 50	+ 0 2	Sunderland.
Dunbar	- 1 14	0 0	"
Berwick	- 1 4	..	"
Holy Island	- 0 52	..	"
Blyth	- 0 7	..	"
Tynemouth Bar	- 0 2	..	"
Seaham	+ 0 2	..	"
Hartlepool	+ 0 6	+ 0 8	"
Whitby	+ 0 23	..	"
S Scarborough	+ 0 49	+ 1 5	"
Filey Bay	+ 0 58	..	"
Flamborough Head	- 1 59	..	Hull.
Bridlington	- 1 50	..	"
Spurn Point	- 1 3	..	"
Great Grimsby	- 0 53	- 1 8	"
Lynn and Boston Deep	- 0 29	..	"
Wells Bar	- 0 9	..	"
" Harbour	+ 0 31	..	"
Blakeney Bar	+ 0 1	..	"
Yarmouth Road	- 2 51	..	Harwich.
Lowestoft	- 2 9	..	"
Orfordness	- 0 51	..	"
Nore	- 0 7	..	Sheerness.
Chatham	+ 0 25	..	"
Gravesend	- 0 57	..	London.
Woolwich	- 0 28	..	"
Greenwich	- 0 24	..	"
London Docks	- 0 10	+ 0 4	"
Margate	- 2 27	..	"
Ramsgate	- 2 23	- 4 1	"
Deal	+ 0 3	..	Dover.
Folkstone	- 0 5	..	"
Dungeness	- 0 27	..	"
Rye Bay	+ 0 8	..	"
Hastings	- 0 19	..	"
Beachy Head	+ 0 8	..	"
Newhaven	+ 0 39	..	"
Shoreham	+ 0 22	- 1 2	"
Littlehampton	- 0 5	..	Portsmouth.
Selsea Bill	+ 0 4	..	"
Bembridge Point	- 0 41	..	"

GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
on	— 1 11	..	Portsmouth.
s	— 0 56	..	”
ber	— 1 41	..	”
int	— 1 55	..	”
h	— 2 41	..	”
.	— 2 31	..	”
reakwater	— 4 40	— 5 10	”
s	+ 0 38	..	Devonport.
.	+ 0 38	..	”
.	+ 0 17	..	”
.	+ 0 33	..	”
breakwater	— 0 6	..	”
.	— 0 17	..	”
.	— 0 29	..	”
.	— 0 46	..	”
.	— 1 13	..	”
(St. Mary)	— 1 16	..	”

WESTERN COAST OF EUROPE.

.	— 1 27	..	Brest.
.	— 2 2	..	”
r)	— 1 17	..	”
.	— 1 17	..	”
.	— 0 47	..	”
.	— 0 17	..	”
.	— 0 2	..	”
.	+ 0 50	..	”
ordouan	— 0 10	..	”
.	+ 3 3	..	”
.	— 0 27	..	”
.	— 0 41	..	”
moutier	— 0 45	..	”
o	— 0 5	..	”
.	— 0 7	..	”
.	— 0 29	..	”
.	— 0 36	..	”
rneau	— 0 35	..	”
.	— 0 26	— 1 9	”
Ushant)	— 0 15	— 0 1	”

NORTHERN COAST OF EUROPE.

.	+ 0 27	..	Brest.
.	+ 1 6	..	”
n	+ 1 30	..	”
.	+ 2 4	..	”
.	+ 2 18	..	”
.	+ 2 26	..	”
usey	+ 2 22	..	”
Helier)	+ 2 38	..	”
St. Peter Port)	+ 2 50	..	”
.	+ 2 45	..	”

NORTHERN COAST OF EUROPE.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Alderney	+ 2 59	..	Brest.
Cherbourg	+ 4 2	..	"
Barfleur	+ 5 4	..	"
La Hougue	+ 4 55	..	"
Honfleur	+ 5 42	+ 4 3	"
Quilleboeuf	+ 6 19	- 9 7	"
Havre	+ 6 4	..	"
Fécamp	+ 6 57	+ 4 2	"
Dieppe	+ 7 19	..	"
Cayeux	+ 7 18	..	"
Boulogne	+ 0 13	..	Dover.
Cape Grisnez	+ 0 15	+ 2 4	"
Calais	+ 0 37	+ 0 10	"
Dunkerque	+ 0 56	..	"
Nieuport	+ 1 6	..	"
Ostend.	+ 1 13	..	"
Flushing	+ 2 8	..	"
Antwerp	+ 5 13	..	"
Hellevoetsluis	+ 3 18	..	"
Rotterdam	+ 4 33	..	"
Helgoland	- 0 33	- 2 10	Harwich.

SET OF THE TIDES ALONG THE SOUTH COAST OF ENGLAND.

The tides about Plymouth Sound are tolerably regular, both flood and ebb, generally running each way about six hours and ten minutes at a mean. In Hamoaze the flood stream continues to run up, on spring tides, about fifteen minutes after high water at Devonport Dock-Yard.

It is high water in Catwater rather earlier than at the Dock-Yard; but with strong winds from the southward and westward the tide flows half an hour longer in both harbours.

At the Breakwater in Plymouth Sound it is high water a few minutes earlier than at the Dock-Yard, but the stream drains in for a short time after the water has ceased to rise.

Abreast of Plymouth Sound, about 6 miles from the land, the streams are very irregular and do not turn with the tide farther out in the offing. One hour and three-quarters before high water at the Dock-Yard the stream makes to the eastward and runs about E. by S. for one hour; during the next hour it is scarcely sensible, after which it turns to the southward, gradually changing to W.S.W. till the last quarter of the ebb on the shore, when it veers from W.S.W. to W.N.W. During the first 3 hours flood on the shore, its direction changes from W.N.W. to N.W., when it begins to slacken, and to set about North, till at the last $4\frac{1}{2}$ hours flood it runs E. by S. as at first.

Four miles south-west of the Eddystone the stream begins to run E. by S. when it is high water at the Dock-Yard, and continues about two hours and three-quarters, when it slacks and shifts to the southward. At $3\frac{1}{4}$ hours ebb on the shore it sets W.S.W.; at 4 hours W. by N.; and then W.N.W. until low water. During the first 2 hours flood on the shore the stream sets N.W. by W., and loses its strength during the third hour, running N.W. and North. During the fourth hour, what little stream there is sets N.N.E. and N.E.; and then E.N.E. and E. by N. till about high water, when its direction is E. by S.

From Bolt Tail to Start Point, at 4 miles off shore, the eastern stream makes at 3 hours after high water, and the western stream 3 hours after low water on the shore; the stream sets along the land, and its greatest velocity is $2\frac{3}{4}$ knots. At neaps the turn of the stream is regular, varying from 4 to 7 hours after high and low water on the shore, the average being 5 hours. Its rate at neaps is $1\frac{1}{2}$ knots: off Start $2\frac{1}{2}$ knots.

Off Exmouth Bar, at three quarters of a mile, south of Straight Point, at full and change, the stream turns to the eastward at 3h. 40m. and to the westward at 11h. 0m., running in the latter direction about 4 hours. The direction of the western stream for the first 2 hours is S.W.; for the next 2 hours west, and then turns gradually to the northward. The direction of the eastern stream for the first quarter is N.E.; at half-tide, E. by N.; and the greatest velocity of both streams is about 1 knot.

Three miles south of Beer Head, the stream turns to the westward at 1h. 30m., and runs in that direction 4 hours, then gradually turns to the northward and runs for 2 hours between W.N.W. and N.E. by N. It may be said to turn to the eastward about 5 o'clock, and for $2\frac{1}{2}$ hours, until half tide, sets from N.E. to E. by N., and for the next 3 hours gradually turns to the southward. The direction of the tide in this position is, therefore, round the compass, with little or no velocity, as even at springs it scarcely runs a knot, and that only for a very short period.

In West Bay, at 2 miles N.N.W. of the Bill of Portland, at full and change, the tide begins to turn at 6h. 35m. and sets as follows: 1st hour of the ebb by the shore, at Portland Breakwater, S. $\frac{1}{2}$ E., $1\frac{1}{2}$ knots. 2d hour, S. $\frac{1}{2}$ W., $1\frac{3}{4}$ knots. 3d hour, S. by W. $\frac{1}{2}$ W., $1\frac{1}{2}$ knots. 4th hour, S.W. by S., three quarters of a knot. 5th hour, N.W. $\frac{3}{4}$ N., nil. 6th hour, from N.N.W. to N. $\frac{1}{2}$ W., three quarters of a knot. 7th hour, N.E. to E. by N., 1 knot. 8th hour, S.E. $\frac{1}{4}$ E., $1\frac{1}{4}$ knots. 1st hour of the flood, S.E. by S., $1\frac{1}{2}$ knots. 2d, 3d, 4th, and 5th hours, S.S.E., 2 knots.

At $2\frac{1}{4}$ miles S.E. $\frac{1}{2}$ S. of the Bill of Portland, near the west end of the Shambles, the 1st hour of the flood by the shore sets west, at the rate of $1\frac{1}{4}$ to half a knot. 2d hour, E. $\frac{1}{2}$ N., half a knot. 3d hour, E. by N., $2\frac{3}{4}$ knots. 4th hour, E.N.E. $\frac{3}{4}$ E., $3\frac{3}{4}$ knots. 5th hour, east, $3\frac{1}{2}$ knots. At the 1st hour of the ebb, E. by S., $3\frac{1}{2}$ knots. 2d hour, E. by S. to S.E. by S., $2\frac{1}{2}$ to $1\frac{1}{2}$ knots. 3d hour, south, 1 knot. 4th hour, S.W. by S., $1\frac{1}{2}$ knots. 5th hour, W.S.W. $\frac{1}{2}$ W., $1\frac{1}{2}$ knots. 6th hour, W. by S., 2 knots. 7th hour, W. by S., $2\frac{1}{4}$ knots. 8th hour, W.S.W. $\frac{3}{4}$ W., $1\frac{3}{4}$ knots. N.B.—About a mile south of the Bill, at half flood, by the shore, the tide sets from S.S.E. to S.E. $\frac{1}{2}$ E., and the opposite stream about W.S.W. $\frac{1}{2}$ W.: the velocity of both streams, at springs, is from 5 to 6 knots; but although the tide runs with such violence near the Race, about a mile S.W. of the Bill the tide was found very weak.

At 5 miles E.S.E. of the Bill of Portland, near the east end of the Shambles, the 1st hour of the flood by the shore sets west, $1\frac{1}{2}$ knots. 2d hour, from West to N. by E., very weak. 3d hour about E.N.E., very weak. 4th hour, E. by N., 2 knots. 5th hour, E. by N., $2\frac{3}{4}$ knots. At the 1st hour of the ebb sets E.N.E., $3\frac{1}{2}$ knots. 2d hour, E.N.E., $3\frac{1}{4}$ knots. 3d hour, east, $2\frac{3}{4}$ knots. 4th hour, east and E. by N., $1\frac{1}{4}$ knots. 5th, east, N. by W., and W. by N., very weak. 6th, 7th, and 8th, about west, from $2\frac{3}{4}$ to $2\frac{1}{4}$ knots.

In Portland and Weymouth Roads there is very little tide, so that the stream is scarcely sensible, and continues to be very moderate along the shore from Weymouth to St. Albans Head.

S.S.W. $\frac{1}{2}$ W., $1\frac{1}{4}$ miles from St. Albans Head, the western stream, at full and change, makes at 10h. 45m., and the eastern stream at 11h. 45m.: the flood and ebb are of equal duration, the former setting from S.E., and the latter from W.N.W. to N.W. by W.; their greatest velocity being at half tide from $4\frac{1}{2}$ to $4\frac{3}{4}$ knots.

At 1 mile S.E. of Durlstone Head, at full and change, the western stream makes at 10h. 25m., and the eastern stream at 4h. 25m., the former setting W.S.W., and the latter E.N.E.; their greatest velocity being about 3 knots: the indraught of the flood stream in thick weather might prove fatal to a ship not on her guard.

At a third of a mile E.S.E. of Peverel Point, at full and change, the western stream makes at 8h. 40m., and the eastern stream at 4h. 0m., the former setting S.W. and the latter N.E.; on the ebb there is a dangerous race over the Ledge, which extends about a mile off the Point. The velocity of the ebb stream is about 3 knots, and that of the flood about $1\frac{1}{2}$ knots. Off Old Harry at three quarters of a mile N.E. by E. of Standfast Point, at full and change, the western stream makes at 9h. 45m., and the flood or eastern stream at 4h. 10m., the flood setting from N.E. by E. to N. by E. at the rate of 1 knot, and the ebb from S. by W. to S.W. 2 knots.

At the Needles, at full and change, the western stream makes at 10h. 0m., and the flood or eastern stream at 3h. 40m., and the velocity of both streams over the Bridge and in the South Channel is from 3 to 4 knots; but between Hurst Point and the Island, $5\frac{1}{2}$ knots, and to the southward of the Bridge about 2 knots. In the Solent, the eastern or flood stream makes at 4h., and near the Bramble at 4h. 30m.*

In Freshwater Bay, about 1 mile S.W. of Brook Point, and the same distance off Atherfield Point, at full and change, the western stream makes at 10h. 25m., and runs at the rate of 1 knot, and the flood or eastern stream at 2h. 35m. from 2 to $2\frac{3}{4}$ knots; both streams take the direction of the coast. W. by S. $4\frac{1}{2}$ miles from St. Catherine Point, the western stream makes at 11h., setting N.W. $\frac{3}{4}$ W. and the flood or eastern stream at 5h., in the opposite direction S.E. $\frac{3}{4}$ E., the rate of both being from 2 to 4 knots; but at 1 mile W. by S. from the Point the streams set N.W. by N. and S.E. by S., 3 to 4 knots, and at two thirds of a mile S.S.W. of the Point, W. by N. and E. by S., with the same velocity.

Nearly 5 miles S.S.E. of Dunnose, at full and change, the stream turns at 10h. 40m. and 4h. 30m. and sets E. $\frac{1}{2}$ S. and W. by N.; velocity, from 4 to 5 knots; but S.E., 2 miles from Dunnose, the flood sets E. by N., and turns at the same time as in Portsmouth Harbour, and the ebb W. by S., but one hour earlier than it does in the harbour.

Princessa. At the N.W. buoy, at full and change, the western stream makes at 10 o'clock, and runs 6 hours W.S.W. $\frac{1}{2}$ W. The eastern stream commences at 4 o'clock, and sets very nearly in the opposite direction, E.N.E. At the S.E. buoy the tides are about half an hour later, and set as follows; viz., the western stream, first part W. $\frac{3}{4}$ S., gradually becomes more southerly, and at the last of the tide runs S.W. by S. The course of the eastern stream is pretty nearly the same throughout the whole of the tide, E. by N.

At the Nab Light Vessel, the tidal stream is nearly rotary, which is probably caused by the Spithead tide meeting the tide round Dunnose

* In the Solent, and as far to the westward as Portland, there are what are termed the *first* and *second* high waters. This double high water is probably caused by the tidal stream at Spithead, for, as long as that stream runs strong to the westward the tide is kept up in Southampton water, and there is no fall of consequence until the stream begins to slack at Spithead, but when the stream makes to the eastward at Spithead the water falls rapidly at Southampton. After low water, the tide rises there pretty steadily for 7 hours, which may be considered as the *first* or proper high water; it then ebbs for an hour about 9 inches, at the end of which time it again commences to rise, and in about $1\frac{1}{4}$ hours reaches its former level, and sometimes higher; this is called the *second* high water. To the mariner, the knowledge that the high water at Southampton remains nearly stationary for rather more than 2 hours may, in some cases, be important. Similar *first* and *second* high water occur on either shore of the Solent, as shown in the times of high water at full and change, page 149.

At Havre, on the French coast, the high water remains stationary for one hour with a rise and fall of 3 or 4 inches for another hour, and only rises and falls 13 inches for the space of 3 hours; this long period of nearly slack water is very valuable to the traffic of the port, and allows from 15 to 16 vessels to enter or leave the dock on the same tide.

somewhere near the Light Vessel; for instance, at the 1st hour's flood by the shore it sets East; 2d and 3d hours, E.N.E.; 4th, N.E.; 5th, N.E. by N.; 6th, North; 7th, N.N.W. to N.W.; and the last drain of the flood, N.W. by W. The 1st hour's ebb sets W. by N.; 2d W. by S. to W.S.W.; 3d, S.W. by W. to S.W.; 4th, S.W. $\frac{1}{2}$ S., the first part of the 5th hour, S.S.W., gradually trending to the southward until low water by the shore, when it sets S.E. There are only a few minutes slack. At full and change, the eastern stream makes at 8h. 30m., and the western stream at 12h. 15m.

At the Warner, at full and change, the eastern stream makes at 2 o'clock, and runs $7\frac{1}{2}$ hours about S.S.E.; and the western stream at 9h. 30m., and runs nearly $4\frac{1}{2}$ hours N.N.W.

Near the Horse Elbow, the tide must be strictly attended to, for in many cases it sets directly over that shoal. The eastern stream makes at 2 o'clock, $2\frac{1}{2}$ hours after the tide on the shore, and runs to the S.E. $7\frac{1}{2}$ hours; the western stream makes at 9h. 15m., $4\frac{3}{4}$ hours after low water on the shore, and runs nearly 5 hours to the N.W.

At the Dean Elbow, at full and change, the eastern stream, which sets over that shoal, makes at 2 o'clock, runs to the S.E. for 2 hours, and then sets east for the remainder of the tide, $5\frac{1}{2}$ hours; the western stream makes at 9h. 45m., and runs W.N.W. $4\frac{1}{2}$ hours.

At Spithead, at full and change, the eastern stream makes about 2 o'clock, $2\frac{1}{2}$ hours after high water in the harbour, and runs 7 hours S.E. by S.; and the western stream about 9 o'clock, $2\frac{1}{2}$ hours before high water in the harbour, and runs 5 hours N.W. by N.

In Portsmouth Harbour the flowing continues about seven hours, and a narrow stream runs in, fifteen or twenty minutes after high water at the Dock-Yard. From the result of three years' observations taken at the Dock-Yard it appears that at high water, slack water at springs continues for eight minutes, and at neaps sixteen minutes.

Looe Stream. At the western entrance near the Pullar Buoy, at full and change, the eastern stream makes at 3h. 45m., and the western stream at 10 hours, and sets S.E. and N.W. Between 2 and 3 miles outside of the Boulder Bank, the stream turns about an hour later; the eastern stream setting E.S.E. and the western stream west. Between the Pullar Bank and the Middle Owers, the eastern stream sets E.S.E. and the western stream west. At the eastern entrance, near East-borough Head, the eastern stream makes at 4h. 30m., and sets E.N.E. $\frac{1}{2}$ E., and the western stream at 9h. 50m. west. Off the west end of the Hooe Bank, the eastern stream makes at 4h. 35m., and sets E.S.E., and the western stream at 10h. 30m. W. $\frac{3}{4}$ N.

About 1 mile S.S.E. of the South Foreland Lighthouse, the stream begins to set to the eastward about 1h. 30m. before high water on the shore at Dover, and runs from N.E. by E. to E.N.E. about $5\frac{1}{2}$ hours, or till 4 hours after high water: it then turns and sets W.S.W. $\frac{1}{4}$ W. about 7 hours. At Dover the flowing stream very seldom continues more than 5 hours, and sometimes scarcely so much; it is nearly the same at Ramsgate. To the northward of the South Foreland the streams change their direction to N.E. $\frac{1}{2}$ N. and S.W. $\frac{1}{2}$ S.

In the Downs the north-eastern stream begins about 1h. 20m. before high water at Dover, and continues to run 5h. 30m.: it then turns and runs in a contrary direction till 2 hours before the ensuing high water.*

In the Gull Stream, 1 mile N.N.W. from the Bunthead, the northern stream begins about 1h. 10m. before high water at Dover, and continues for 6 hours: it then turns and runs in a contrary direction till $1\frac{1}{2}$ hours before the ensuing high water. Its direction is N.E. $\frac{3}{4}$ N.; but the last hour changes to E.N.E., and even to the southward of East; the last hour of the southern stream changes from S.W. $\frac{3}{4}$ S. to W.S.W., and even to the northward of West.

* For the tides at the Southsand Head and Northsand Head of the Goodwin, see Compartment VI.

TIDES ON THE EAST COAST OF SCOTLAND AND ENGLAND.

In the North Sea the flood tide-wave enters from the Atlantic Ocean between the coast of Norway and the British Isles, and passes through the various channels formed by the Shetlands, the Orkneys, and the north point of Scotland. The average rate of the stream in the offing is very moderate, not exceeding a knot and a half; but that part of the stream which enters by the Pentland Firth acquires a furious rapidity, amounting at spring tides even to eight knots. Immediately on quitting the Firth, however, it abates in strength, as it diverges into open water; its eastern branch filling up the basin of the North Sea as it advances towards the coast of Jutland and Holland; whilst its western branch, more or less confined by the Dogger and other outlying banks, swells along the shores of Scotland and England, and makes high water in all their rivers and harbours successively till it arrives in the Thames.

The following remarks will assist the seaman in tracing the movement of the tide stream along the coast :—

Off Clythness and Ord Head its rate is about 3 knots at the springs and $1\frac{1}{2}$ with the neaps, and continues to run to the southward till 11 o'clock, or till 3h. 40m. before high water at Leith. Off Covesca Point, Burgh Head, and thence westward towards Fort George and Cromarty, it runs about an hour longer.

Off Cullen the flood stream sets slowly to the eastward, increasing in velocity as it advances: off Troop Head it runs till 1 o'clock, or till 1h. 20m. before high water at Leith; off Kinnaird Head it attains the rate of 2 knots on springs, and is still accelerated as it passes Rattray Brigs till off Peterhead, which is occasioned by the junction of the direct stream from Duncansby Head. Six miles off Kinnaird Head the stream runs to the southward till 2, and at 12 miles till 3 o'clock, or till 40 minutes after high water at Leith.

Off Buchanness the stream attains its greatest strength, namely 4 knots on the springs, and $2\frac{1}{2}$ on the neaps; but off Newburgh it decreases to less than 2 knots, and ceases at 2 o'clock; and at 4 or 5 leagues in the offing it runs till 3 o'clock, or 40 minutes after high water at Leith.

The stream runs past Girdleness till 2h. 30m., or 10m. after high water at Leith; springs at the rate of $2\frac{1}{2}$, neaps $1\frac{1}{2}$ knots. It runs across the mouth of Montrose Harbour and past Red Head till 3 o'clock, or 40 minutes after high water at Leith. From Red Head it sets into St. Andrews Bay till the last quarter, which sets S. and S.S.E.; but to the westward of Red Head it sets W.S.W. past Arbroath and over the Tay Bar.

At 2 miles without the Bell Rock Lighthouse the flood continues running to the southward till 2h. 55m. after high water at Leith; but between the Bell Rock and Fifeness it changes 2 hours earlier. The first part of the latter stream sets towards May Island, the middle to the South, and the last part S.S.E. The first part of the ebb sets from E.N.E. to N.E., the middle N.N.E., and the last part more northerly.

About a mile off St. Abbs Head the flood stream runs to the south-eastward till 2h. 55m. after high water at Leith; but at $5\frac{1}{2}$ or 6 leagues in the offing it continues a quarter of an hour later. About 3 miles off Berwick it runs till 4h. 10m. after high water at Leith.

At 5 miles off North Sunderland Point, and at the same distance south-eastward of the Staples, the flood stream continues till 3h. 25m. after high water at Leith.

About 2 miles off Blyth Harbour, and 4 miles off Tynemouth, it runs to the southward till 3h. 40m. after high water at Leith; and at 4 miles off Sunderland, a quarter of an hour later.

At 3 or 4 miles off Hartlepool, and at the same distance off Whitby the flood stream runs to the southward till 4h. 10m. after high water at Leith; and at the same distance off Flamborough Head it continues to run half an hour longer.

Near the Norfolk and Suffolk coasts the streams of tide run nearly parallel to the shore. Off Wells the flood runs to the eastward till 9 o'clock, or three hours after high water on the shore.

Four miles off Cromer, and the same distance off Hasborough, the flood stream runs along shore to the southward till 10h. 15m., or 1h. 45m. before high water at Harwich, and the ebb in a contrary direction.

At $2\frac{1}{2}$ miles off Lowestoft the flood stream continues to run to the S.S.W. till 1h. 30m. before high water at Harwich.

At Orfordness the flood stream continues to run till about high water in Harwich Harbour; the flood sets W.S.W., and the ebb E.N.E.

At Margate it is high water about 1h. 40m. by the ground. Near the East buoy of Margate Sand, at the first of the flood, on the shore the stream sets S. by W., veering westward, till about half flood, or 9h. 15m., it sets west, and continues veering, till at high water it falls slack at N.N.W. The ebb stream begins at N.E., veering eastward, and increasing in strength till about half ebb, or 2h. 45m., when it sets S.E. by E., still veering, and the latter part with diminished velocity, till at low water it falls slack at south.

In the River Medway the flood stream runs up in mid-channel from twenty to twenty-five minutes after high water at Sheerness Dock-Yard; but at the Nore Light Vessel, although it is high water by the ground a few minutes earlier than at the Dock-Yard, yet the stream runs up the Thames for half an hour after high water at the Yard.

It remains to be noticed that the direction of strong winds, as well as the varying pressure of the atmosphere, considerably affect both the times and the heights of high water. Thus in the North Sea a strong N.N.W. gale and a low barometer raise the surface 2 or 3 feet higher, and cause the tide to flow all along the coast from the Pentland Firth to London half an hour longer than the times and heights predicted in the Tables. Easterly, S.E., and S.W. winds produce opposite effects, which will be felt as far down the Channel as Dungeness. On the contrary, at the entrance of the Channel, at Plymouth, and as far up as Portland, south-westerly winds, with a low barometer, raise the surface of the water; and north-easterly winds and a high barometer always lower it.

The winds affect also the locality of the meeting of the North Sea and Channel tides: during moderate breezes this takes place somewhere between the North Foreland and the north end of the Goodwin Sands, to the southward, and between the Kentish Knock and the Galloper to the northward; but both these places of meeting are liable to be removed further south or north by strong northerly or south-westerly winds.

THE TIDES AMONG THE ORKNEYS.

BY COMMANDER F. W. L. THOMAS, R.N.

THE great rapidity of the tidal streams among the Orkneys makes a correct knowledge of their periods and velocities of the utmost importance to the mariner. *General Remarks.*

In the terrific gales which usually occur four or five times in every year, all distinction between air and water is lost, the nearest objects are obscured by spray, and everything seems enveloped in a thick smoke; upon the open coast the sea rises at once, and striking upon the rocky shores, rises in foam for several hundred feet, and spreads over the whole country.

The sea, however, is not so heavy in the violent gales of short continuance as when an ordinary gale has been blowing for many days; the whole force of the Atlantic is then beating against the Orcadian

shores, rocks of many tons in weight are lifted from their beds, and the roar of the surge may be heard for twenty miles; the breakers rise to the height of sixty feet, and on the North Shoal, which lies 8 miles N.W. of Costa Head, the broken sea is visible even at Skail and Birsa.

Similar effects may be witnessed in any stormy region, but here they are increased by the power of the tidal stream, and when the whole mass of water is in motion, a very slight inequality at the bottom of the sea is indicated by a ripple on the surface, so that by these means I have detected shoal spots (to the eastward of North Ronaldsha) at a depth of 47 fathoms, though the difference in depth was but 20 feet. On the rocky bank of the North Shoal, which is about 4 miles in length, the ripple readily distinguished any inequality of 10 and 15 feet, at a depth of 30 fathoms, even when the stream was moving but one mile per hour. It is only in calm or very fine weather that these ripplings can be observed, but when the wind increases upon a weather tide the sea will break over every inequality of the sea bottom. These broken seas are dangerous, and during the survey of these Islands I have often been in great peril from moving the ship before sufficient time had elapsed for the sea to become quiet.

The body of the tide-wave comes from the N.W., and makes high water on the whole west coast of the Orkneys at nearly the same time; the establishment for Stromness being 9 o'clock, and that for Pierowall in Westra, is about 6 minutes later. At the north-east end of the Orkneys it is but a few minutes later than at the north-west, as the establishment for Otters Wick is 9h. 13m.; but the tide there is probably retarded by having to pass over the shoal water at the mouth of the bay.

On the south-east side of the Orkneys, in Holm Sound, the high water there being derived from the tide-wave entering by the Pentland Firth takes place about 9h. 35m.

The vulgar establishment, or time of high water, full and new moon, varies greatly; the mean of nine observations at Otters Wick gives 9h. 13m., but they vary between 8h. 58m. and 9h. 42m.

When the tide has to pass through a narrow or shallow channel, the retardation is very great; thus it is high water an hour earlier at the mouth of Eynhallow Sound than at Kirkwall, though the distance is but 11 miles; and by levelling across Sanda (about half a mile), it appeared that when it was high water at Otters Wick, the sea-level was 4 feet 8 inches above the sea-level of Catasand, and that high water was 1h. 43m. later at Catasand than at Otters Wick.

The mean range of tide at springs in the North Isles of the Orkneys is 11 feet 2 inches, and at neaps 5 feet 6 inches.

Extraordinary springs may be 3 feet 4 inches above or below the mean; this result is greatly increased by the semidiurnal inequality; for in some instances the difference in the rise of two consecutive tides has been observed to amount to 2 feet 10 inches.

In the South Isles the mean range at springs is about 1 foot less than in the North, being 10 feet; at neaps 5 feet.

The passage from the westward round the North end of the Orkneys is rendered somewhat treacherous by the peculiar set of the tide; for the body of the flood stream coming from the north-west, a ship must be 6 or 7 miles to the northward of the Mull of Papa to drift clear of North Ronaldsha. The first half of the flood sets from the Mull right for North Ronaldsha (S.E. b. E. $\frac{1}{2}$ E.), and should the wind fail while the flood is running, there would be a great probability of drifting ashore.

The flood stream passes slowly the North coast of Westra (sending a weak offset between Papa and Aikerness), and joins the main

*Depth of the
Tidal Stream.*

*High water
at*

*Stromness,
Pierowall,*

Otters Wick,

Holm Sound.

*Difference of
Sea-level.*

*Mean range at
North Isles.*

*Semidiurnal
inequality.*

South Isles.

*Set of tide,
Mull of Papa.*

*from Mull of
Papa to North
Ronaldsha.*

am off Moul Head, where a bore or *röst** is formed, which stretches several miles to sea. The tide here runs about 6 knots; between Papa North Ronaldsha 3 knots; but near North Ronaldsha the rate increases to 6 knots, passing over the Altars of Linnay and Seal Skerry with great violence. The flood splits on the West coast of North Ronaldsha with the Established Kirk (the southernmost) in one small byre; and should a vessel be drifting down on the island, she should endeavour to pass to the southward, when she will go clear of everything.

*Bore off Papa.
Rate of Tide.*

off Seal Skerry there is a bad *röst* with southerly winds, and the tide runs at six knots between that point and Dennis Head; it does not, however, touch the shore, but leaves a small eddy or counter-tide, so that boats can turn up as far as the Skerry.

*Seal Skerry
Röst.
North
Ronaldsha.*

The tide sets strongly between Fair Isle and the Orkneys. For on one occasion having Dennis Head bearing S. $\frac{1}{4}$ E. distant 8 miles, the vessel having set S.E. $\frac{3}{4}$ S. for three hours, and being then high water on the shore, it shifted its direction $3\frac{1}{4}$ points; that is, it set South for the next three hours, or until it was half-ebb on the shore, its greatest rate having been 3 to 4 knots. An hour before this, the vessel's track began to take a curved form, which continued to grow sharper as the rate of tide decreased, so that without any stopping, we found ourselves running with the ebb stream North, and parallel to, but at the distance of several miles from, our former track. The ebb stream continued steadily North for four hours, running 2·8 at its strength, after which it began to curve to the eastward; the stream thus appearing to describe a long spiral, and revolving in the direction of the hands of a watch.

*Tide Streams
between Fair
Isle and the
Orkneys.*

It also appears that when it is half-flood on the shore, it is slack in the stream; that when it is low water on the shore, the flood-stream is running strongest, but changing its direction from S.E. $\frac{3}{4}$ S. to South, and that the reverse happens during ebb tide.

*Tide and half-
tide.*

These observations will show how little dependence can be placed on a direct course among these treacherous tides; and those who have been beating about for some days against a head wind are particularly exposed to this danger. It is a common remark with the people of North Ronaldsha, that all vessels come ashore with the flood; and it is readily seen how this takes place, for the accident of it being either flood or ebb tide will make a difference of between 30 and 40 miles in position.

The flood stream from Runabrage sets into North Ronaldsha firth at the rate of 3 knots; from the Holms of Eyre it sets over the Baas of Sanda, and both streams passing through the firth at the rate of 4 knots, continue to run two hours after high water on the shore.

*North
Ronaldsha
Firth.*

off the Start the first of the flood sets to the southward at 4, but changes, as the stream grows older, to S.W. There is an extremely strong *röst* off the Start with southerly winds and flood tide; it stretching 4 miles to sea, but being heaviest near the shore.

*Start of Sanda.
Röst.*

Between Westra and Sanda the stream is scarcely sensible, but increasing in strength as it approaches Calf Sound and Lashy Sound, it runs through those narrow passes at the rate of 6 knots; but decreasing to 2 or 3 knots in Eda Sound, where the stream falls into the Sanda Firth. In those Sounds the stream runs $1\frac{1}{2}$ hours after it is high water on the shore.

*Calf and Lash
Sounds.*

In Spurness Sound the tide begins to the eastward half-an hour before low water on the shore, or $1\frac{1}{2}$ hours before it is low water in the bay, and turning every six hours. This stream is like a mill-race in

*Spurness
Sound.*

* (pronounce *rust*) a Scandinavian word, meaning a roaring, broken, tidal sea.

the narrows when passing Spur Ness, but it speedily becomes in Sanda Sound, and off Kettletaft it scarcely runs 2 knots.

*Stronsa and
Westra Firths.*

In the Stronsa and Westra Firths, which form one continuous nearly straight channel, the tide stream is very rapid, as through Eynhallow Sound the body of the ocean tide is discharged.

North Shoal.

At the North Shoal, which is 15 miles from the entrance of the tide sets W. by S. (towards the entrance), and at spring runs 2 miles an hour; neaps about one.

*Brough of
Birsa.*

Along the coast of West Mainland, or Pomona, the stream is sensible off the points; but off the Brough of Birsa the flood sets to the northward for two hours after it is high water on the coast when its greatest rate is 2 knots.

*West coast of
Rowsa.*

From the Brough of Birsa the flood sets along shore for 4 miles to the Sacquoy Heads, increasing in velocity as it approaches the Firth. The influence of the indraught through Eynhallow Sound is scarcely felt beyond a line joining Costa Head and the Reef of (Costa Head).

Skea Skerries.

The flood stream runs South along the West coast of West Mainland to the Noup to the point of Skea, and over the Skea Skerries. Between them and Rowsa the stream acquires great force, even 6 knots; it does not turn for two hours after high water on the shore.

*Kili Holm.
War Ness.*

The weight of the flood passes close round Kili Holm, and crosses for War Ness (South Point of Eda,) and the Greenholms.

Stronsa Firth.

At War Ness the tide stream runs 7 knots, and the röst is passable during southerly gales and spring flood. At that time the Sound between the Gio Ness of Shapinsha and War Ness is in commotion, and when bound to Stronsa, a line of breakers is sometimes to be seen roaring and foaming within half a cable's length, vainly looking for a gap or smooth.

The main stream from War Ness, joined by the Stream from Eynhallow, sets past Rousholm Head, and clear of Auskerry to the open sea from the Greenholms, past Shapinsha and Deerness, where it is called by the String, the usual name for the direct run of the stream through Eynhallow Sound by Gairsa, Eller Holm, and Deerness. Its rate between Shapinsha and Rousholm is 6 knots, and between the Mull of Gairsa and Auskerry about 4 knots.

*Weatherness
and Fara Ness
Sounds.*

The tides in Weatherness and Fara Ness Sounds are peculiar. The flood stream turns to the eastward as soon as the tide has ceased to set towards the shore; that is, the flood stream makes $2\frac{1}{2}$ hours before it reaches the Westra Firth. The stream pours through the narrows of Weatherness and Fara Ness Sounds at the rate of 4 knots, and then sets westward towards Calf Sound.

*Egilsha and
Shapinsha.*

A very weak stream runs south through Howan Sound during flood, and it is also weak on the East side of Egilsha; for the body of the stream goes transversely across the channel, and leaves comparatively still water along Egilsha and the North side of Shapinsha.

*Eynhallow
Sound.*

The flood stream from Costa Head and the reef of Quenahall towards Eynhallow, and divides there, passing Burgher and Race at the rate of 7 knots; the streams unite when past the island, and do not average more than 4 knots down Eynhallow Sound.

*Wyre Sound.
Swine Holm.*

A very weak stream passes eastwards through Wyre Sound, and another South of Wyre island; but off Swine Holm, where the flood stream unites with that from the Westra Firth, the rate scarcely exceeds 2 knots. In the narrow channels among the group of Holms, Gairsa and Shapinsha, the flood sets southerly 6 knots.

*Between Gairsa
and Shapinsha*

*and by Work
Head.*

The main stream from Eynhallow Sound passes S. of Gairsa, and thence transversely to Stromberry Head, and on through Eynhallow Sound. The tide stream is narrow in its passage between War Ness and Eller Holm, nor does the *String* expand for some distance.

passing that place ; the rate at springs is about 3 knots, and the stream does not turn till 1½ hours after high water on the shore.

The flood-stream running through Hoy Sound commences on the North Side at the Millstone Quarry, 4 miles from Hoy Mouth, and on the South from Hoy Head; the indraught is scarcely felt 5 miles outside the entrance.

Hoy Sound

In Hoy Mouth the rate of the stream is 4 knots, until it divides upon Gremsa, when the rate increases to 6 knots; one stream passing through Burwick Sound, the other between Gremsa and Stromness. The tide goes over the Skerry Ness, and from thence sets fair for the Skerries of Clestron, where it divides, one stream running up and filling the Bay of Irland, and at half flood setting as a back-tide out of Cairston Road ; the other setting rather off shore at first, and then towards Houton Head. From Burwick Sound the stream sets along the shore of Hoy to Green Head, the rate being scarcely 3 knots; and Gremsa causes a large arrear of slack water in the middle of the Sound. After passing Houton Head, the flood stream becomes diffused in Scapa Flow, and is only sensible off that point; its general direction is towards Holm Sound, and at the Barrel of Butter it scarcely runs 2 knots at springs. On the West side of Holm the stream drains along shore to Halcrow Head, where it meets the stream from the Pentland Firth.

BurwickSound.

Houton Head.

Scapa Flow.

The tide stream runs with greater velocity and turbulence through the Pentland Firth than in any other part of the Orkneys; so that with a strong gale and a weather spring-tide the sea is in many places impassable, and after the wind has gone down, the sea continues to break with great violence for some days, indeed in a sailing ship more danger is to be apprehended from a calm than from a gale of wind. The tide wave from the Atlantic, opposed by the West coast of the Orkneys, is pressed against the shores of Caithness, where at Thurso the tide rises nearly 5 feet higher than at Stromness, though the latter is but 20 miles to the northward. This accumulated mass of water finds egress through the Pentland Firth, where the velocity of the stream near the Little Skerry was said by Captain Otter to have acquired the rate of 10 knots. At the Great and Lothar Skerries, which resist a large body of the tidal stream, the water is sensibly higher by 1 or 2 feet upon the stream side, and a small rapid is formed, of little height indeed, but of great power. Vessels that have drifted upon this rock, when covered by the tide, have been rolled over it, and sunk in deep water on the other side.

Pentland Firth.

The establishments of the following places in the Pentland Firth were determined by Captain Otter :—

Establishments.

PLACES.	High Water.	Rise above the Spring L.W.		Range, or Rise between L.W. and H.W.		REMARKS.
		Spring.	Neap.	At Springs.	At Neaps.	
	h. m.	ft. in.	ft. in.	ft. in.	ft. in.	
Thurso, Scrabster Road -	8 28	14 10	11 0	14 10	5 6	Deduced from 4 years observations. Mean of 19 comparisons, but very irregular. Mean of 12 comparisons with Thurso.
Duncansby Ness -	10 14	10 0	8 6	10 0	4 0	
Stroma, South Side -	9 47	9 0	7 6	9 0	4 0	
Swona, East Side -	10 24	- -	- -	- -	- -	Mean of 33 comparisons with Thurso.
West Side -	9 35	- -	- -	- -	- -	
Pentland Head, Great Skerry, East Side -	11 4	9 3	8 0	9 3	3 0	
Great Skerry, West Side -	10 53	- -	- -	- -	- -	Mean of 7 comparisons with Thurso.
Widewall -	9 3	- -	- -	- -	- -	

The directions as well as the velocities of the tidal streams in Pentland Firth vary with the hour of the tide; and in almost every case the flood takes a more southerly direction as the tide grows on and the contrary with the ebb.

Rate.

Direction.

The flood stream comes South along the shore of Hoy, and East along the coast of Caithness; and the indraught increases in approaching entrance. Between Turn Ness and Dunnet Head the usual spring rate is 7 knots, but as they round the South end of Swona and North end of Stroma, it rises to 9 knots, and when rushing past the Great Lothar to 10. About $1\frac{1}{2}$ hours after it is high water on the shore the flood stream makes strong along the coast of South Walls, curving to the northward of Swona, washes the Great Lothar, passes to the northward of the Pentland Skerries.

At a later period of the tide, the stream from Brims Ness goes direct to the South end of Swona and to the Southward of the Pentland Skerries; so that after it is half flood in the stream (equal to high water on the shore), if a ship is a mile to the southward of Brims Ness, she will pass a mile to the southward of Swona, and the same distance to the southward of the Skerries.

Hoxa Sound.

From Cantick Head the flood stream sets past Stangar Head, crossing Hoxa Sound divides on the Lime Kiln; one very weak stream setting to the southward along South Ronaldsha, while the other about 4 knots towards Water and Holm Sounds.

Holm Sound.

Through Holm Sound the rate of the stream is 6 knots where strong, and it turns at one hour after it is high water on the shore. The rate through Water Sound is 4 knots.

Water Sound.

Cantick Sound.

*East side of
Hoy.*

From Cantick Head a weak stream runs northwards, filling the Hope and the bays on the east side of Hoy, and finding outlets through Gutter and Weddel Sounds; the rate at springs in the narrowest of these Sounds is 2 knots.

*Pentland Firth;
round Swona ;*

Between Cantick Head and Swona the general direction of the stream is towards South Ronaldsha, and southward between it and Swona but it is almost impossible to predict exactly what direction a driven vessel would take; with Barth Head open North of Swona, the quarter flood would send her to the northward of that island, and through the mid-channel between it and South Ronaldsha; but the half flood would probably press her too close to Barth Head, and perhaps to the Great Lothar.

from Widewall.

The first of the flood stream from Widewall sets direct on the North Head and the Lothar, so that in light winds vessels should in all cases pass as near to the North Head of Swona as possible. As a general rule, if a ship, having left Widewall with light winds and flood, should drift nearer to Swona than Barth Head, she will be likely to clear the Lothar—if nearer to Barth Head, she will go too close to the rock.

*Pentland
Skerries.*

When the flood stream first makes at the north head of Swona it first sets across the channel, but presently turns to the southward, passing clear of the Lothar, and then to the northward of the Pentland Skerries but after half flood in the stream, equal to high water on the shore, the stream from the north end of Swona bends round to the southward of these islands, and consequently, at a certain period of the tide it flows towards them.

Between the Lothar and the Skerries the flood stream sets fair across the sea, about E.S.E., joining the main stream from Stronsa Firth.

From the South end of Swona the first flood sets right on the North Skerry, dividing there, and running 7 knots close to the North Skerry. On the South side the stream sets off (leaving a narrow eddy inside) first towards the Little Skerry, but it gradually curves and goes clear

the Clette. A vessel, however, must be very near the Great Skerry to drift in that direction ; if only half way between the Great and Little Skerries she would infallibly drive upon the rocks, where the current runs like a mill-stream. It must be observed, that the general tendency of the flood-stream is to set clear to the westward of the Skerries, and that a vessel must be very near the opening between the Great and Little Skerries before she would feel its indraught. After half tide in the stream, the set of flood from Swona goes well clear to the southward of the Pentland Skerries.

I cannot state with the same personal confidence the direction of the streams of tide on the South side of the Pentland Firth, but the experiments of Capt. Otter show that the flood stream from Dunnet Head and St. Johns Point has a tendency to pass to the northward of Stroma, so that a buoy set adrift within half a mile of Mey Bay will not float through Inner Sound, but rather drift on shore on the west side of Stroma ; and from this it would appear that a vessel one mile to the northward of Dunnet Head, with strong flood, will go well clear to the northward of Swona.

Inner Sound.

The last of the flood stream is pressed down upon Duncansby Head, where it does not cease running till 4 hours ebb on the shore ; for which reason, when a vessel is turning up from the southward, she should rather endeavour to enter the Firth upon the North side, when she will usually be able to get as far as Brough Ness while the flood is still running.

Duncansby Head.

There are large eddies under Stroma and Swona with the flood, and where they meet the main stream little whirlpools are produced, which credulity has exaggerated into objects of importance ; on rare occasions they might be dangerous to boats.

Eddies of Swona and Stroma.

It is almost still water to the eastward of the Skerries during flood, and a large eddy is formed between the Great Lothar and Old Head, commencing at half-flood on the shore ; it is called Liddel Eddy, from a farm of that name in South Ronaldsha.

Eddies of Pentland Skerries; and Liddel Eddy.

Wherever the tide stream is rapid past any point there is always an eddy on the opposite side, and these eddies increase as the tide grows older, till at last only a narrow stream of the former tide is left ; this may be well witnessed in Hoy Sound, where the flood stream is sometimes diminished by the encroaching ebb to 20 and 30 feet in breadth.

The indraught of the ebb stream to the Pentland Firth is felt at a considerable distance from the entrance, so that vessels leaving the Mull of Deerness in calm weather are sometimes drifted into the Pentland Firth. From Copinsha the stream runs nine hours to the southward, from half flood on the shore to low water ; but its rate is slow, never exceeding 2 knots, except near Old Head, where it runs four.

Ebb stream,

There is not much danger to be apprehended from the ebb stream in the Pentland Firth when it has made strong ; about 3 hours after low water on the shore, it sets fairly through between Duncansby Head and the Skerries, between Swona and Stroma, and over towards Hoy ; and a vessel must be far within a line joining Duncansby Head and the North end of Stroma, to feel the indraught of the Inner Sound ; for a buoy that has drifted through that Sound with the flood stream will not return with the ebb.

in the Firth.

Inner Sound.

Round Brough Ness the ebb pours with great violence, and over the tail of the Great Lothar, where several vessels have thereby been lost.

Great Lothar.

The stream from the North side of the Pentland Skerry sets upon Swona, dividing upon the South Clette ; but the last part of the ebb will go to the northward, between Barth Head and Swona.

Swona.

From the North Head of Swona the first ebb goes towards Brims Ness, the last towards Switha. There is a very large eddy under Swona

Eddy.

during ebb tide, which before the tide is done almost reaches as far as Cantick Head.

*Eddy of
Stroma.*

The ebb stream sets fairly through the Firth from the North end of Stroma till it meets the stream coming from Inner Sound and inclines to the eastward; at half tide these united streams set over toward Turn N where the last of the ebb tide drains, while there is comparatively little water on the South side, between Dunnet Head and St. Johns Point.

It does not appear necessary to follow the course of the ebb stream throughout the Orkneys, as in almost every case it is the reverse of the flood, nor to enter into detail of those phenomena which are common to all masses of water in motion, and which any one, by observing the directions of the channels and the apparent obstructions of several streams, can learn from the chart.

REMARKS ON THE SET OF THE TIDAL STREAMS IN THE IRISH AND ENGLISH CHANNELS, AND IN THE NORTH SEA.—BY REAR-ADMIRAL F. W. BEECHEY, F.R.S.

*The Common
Standard for
the turn of the
Streams*

A CAREFUL investigation of the tides in the Irish Channel, the English Channel, and in the North Sea, has shown the possibility of referring the movements of the several streams to a common standard, instead of resorting to the troublesome process hitherto in use, of comparing the motion of the streams with the varying times of high water at the coast.

*is High Water
at Dover and
Liverpool.*

For the entrance of the English Channel and North Sea the time of high water at Dover may be considered the standard; and for the whole of the Irish Channel, the time of high water on the shore at the entrance of Liverpool.

*Off mouth of
English
Channel.*

Off the mouth of the English Channel the stream, although materially influenced by the indraft and outset of the Channel, will be found running to the *northward and eastward*, while the water is *falling* at Dover; to the *southward and westward* while it is *rising* at that port. The particular direction given to the stream in this part of the sea, by the meeting of the Channel and of the offing tides, will be shown in the following table (Compartment I.); and it is only necessary to mention here, that southward of the parallel of Scilly, the tides of the Channel and of the offing blend together with varying force and direction, and occasion the stream to be constantly changing, and in some places even to run round the entire circuit of the compass in one tide, without ever remaining long upon any one point. So that any written description of the course is rendered almost impossible, and the table alone must be consulted for the direction at any particular hour. From this revolution of the stream, it has been asserted that a vessel can never be carried far in any one direction by the tide. Such, however, is not the case; for, although it may be true that while at anchor in a particular spot the vessel's head will turn to every point of the compass, directly she is loose she will be carried away upon a rhumb depending upon the state of the tide at Dover.

South of Scilly.

Bristol Channel.

From the parallel of Scilly to the Bristol Channel the stream is regular, and while the water is *falling* at Dover, will be found setting to the *northward*: near the coast partaking of the direction of the shore, turning sharply round Trevose Head and Hartland Point into the Br

Channel; and while the water is *rising* at Dover, setting as sharply out of the Bristol Channel and along the land towards Scilly.

By many observations, the Light vessel at the Seven Stones has been found to swing to the *northern* tide 7 minutes after high water at Dover; and at Trevoise Head the northern tide to make 12 minutes after Dover. And as a vessel advances up the Bristol Channel the stream turns progressively later. The tides of that estuary do not follow the same law exactly as the tides of channels which are open at both extremities. The directions of the stream in the Bristol Channel will be given hereafter; at present I wish to draw the attention of the seamen to the particular fact, that while the stream from Scilly is setting to the *northward* the stream from the Irish Channel will be found setting to the *southward*, and that these streams meet off the entrance of the Bristol Channel in about the parallel of $51^{\circ}00$ where both turn into that channel. As a general rule, in all the space eastward of a direct line joining Scilly and the Tuskar, the stream will be found running to the eastward towards the Bristol Channel, while the water is *falling* at Dover and Liverpool, and *vice versa*, setting to the *north-east* on the southern side of the Channel and to the *south-east* on the northern side. Such is the general set of the stream in this part of the sea, which I have given in general terms to show that to the eastward of the line above mentioned a strong indraft towards the Bristol Channel will always be experienced while the water is falling at Liverpool, and *vice versa*. To the westward of this line the tides appear to be slack; but we are in want of further observations in all this part before any particulars can be entered into. Towards Cape Clear the northern stream from Scilly seems to join the southern and western streams from the Irish Channel, and both pass to the north-west round Cape Clear, and *vice versa*.

Seven Stones.

Meeting of the Stream in $51^{\circ} N$.

Streams between Scilly and Tuskar.

Off S. coast of Ireland.

At the Smalls Lighthouse it is slack water 5 minutes before high water at the entrance of Liverpool; the stream sets past the rock in a S. by W. $\frac{1}{2}$ W. direction while the water is *falling* at Liverpool, and N. by E. $\frac{1}{2}$ E. while it is *rising* there, veering to N. by E. during the two last hours of the tide. The strength of the tide is sensibly felt hereabout and all the way from the Smalls to Pembroke, running upwards of $3\frac{1}{2}$ or 4 knots at the height of the springs. To the southward of the Smalls the stream sweeps round in a broad curve to the S.E., and enters the Bristol Channel while the water is *falling* at Liverpool and *vice versa*, as before stated. The *entrance of Liverpool* is properly the standard to which the turn of the stream in these pages is referred, and wherever a reference is made to that place it must be understood as being 18 minutes *earlier* than the time of high water at St. Georges Pier, to which the tide tables are adapted.

Off the Smalls.

On the Irish side, at the Saltees Lightship, for instance, the water is slack 22 minutes before it is high water at Liverpool entrance. The stream sets W.S.W. from a quarter of an hour before high water at Liverpool entrance to $1\frac{1}{4}$ hours after, and then W.N.W. to low water. The flood or *rising tide* at Liverpool sets past the Saltees for the first 3 hours E. by S., then E.S.E. for the 2 next hours, and S.E. by E. for the last hour, when the tide slacks, as before, 22 minutes before high water at Liverpool entrance.

Off the Saltees.

From the Saltees Lightvessel to the Tuskar the stream sets along the land, but towards Carnsore Point begins to tend to the northward on the flood, and finally sets sharply round that point into the Irish Channel, and must be carefully watched by vessels in this situation.

Off Carnsore Point.

SECTION I.

THE TIDAL STREAMS OF THE IRISH CHANNEL, WITH
SHOWING THEIR COURSE AND RATE WHEN AT THEIR
STRENGTH.

*Streams turn
with the tides
of Liverpool
and Morecambe
Bay.*

IN the Irish Channel, as before observed, experiments have notwithstanding the variety of times of high water throughout, the turn of the stream over all that part which may be a fair navigable portion of the Channel is nearly simultaneous; northern and southern streams in both Channels commence all parts (practically speaking) at nearly the same time; and the time happens to correspond nearly with the time of high and low water at the shore at *the entrance* of Liverpool and of Morecambe Bay, remarkable as being the point where the opposite tides coming from the extremities of Ireland terminate. So that it is necessary to know the times of high and low water at either of these places to determine the hour when the stream of either *tide will commence in any part of the Channel*. For this purpose the tide-table may be used, subtracting 18 minutes from the time given, in consequence of the high water at St. Georges Pier being 18 minutes earlier than the point which is considered as the head of the tide.

*Streams enter
N. and S. of
Ireland.*

The tide from the Atlantic enters the Irish Channel by two openings, of which Carnsore Point, the S.E. point of Ireland, and Malin Head, the S.W. point of Wales, are the limits of the southern Channel; Rathlin and the Mull of Cantyre the boundaries of the northern.

*Southern
streams from
Tuskar to the
Isle of Man.*

The *central portion of the stream* of flood or ingoing stream runs nearly in a line from a point midway between the Tuskar and Malin Head to a position 16 miles due west of Holyhead; beyond which it expands eastward and westward; but its main body preserves its direction straight forward towards the Calf of Man, which it passes with increased velocity as far as Langness Point, and then at a more moderate rate on towards Maughold Head. Here it meets by the flood or southern stream from the North Channel coming from the Point of Ayr, and is first turned round to the eastward and then goes on with it at an easy rate direct for Morecambe Bay, changing its direction nearly eight points.

*Eastern Branch
of S. stream sets
into Cardigan
Bay.*

The *outer portions* of the stream are necessarily deflected from the course of the great body of the water by the impediments on the Irish side of the Channel, and by the tortuous form of the coast of the Welsh. The eastern portion passing Linney Head, rushes with rapidity between the Smalls, Grassholm, and Milford Haven and Bishopscote, which it passes at a rate of between 4 and 5 knots; then round those rocks in an E.N.E. direction right over the Bass of Cardigan into Cardigan Bay; makes the circuit of that Bay, and sets out towards Bardsey, at the other extremity of it; then sweeps N. by W. past the island and through the Sound, it gradually follows the course of the shore, round Caernarvon Bay, filling the Mersey as far as Bangor; but the stream still continuing outside the Sound of South Stack, which it rounds, setting towards the Skerries at a rate of upwards of 4 knots; and, finally, turns sharp round those

* The entrances of Liverpool and of Morecambe Bay are, as before observed, 18 minutes earlier in their times of high water, than those given for Liverpool tide-tables.

Liverpool and Morecambe Bay; completing in its way the high water in the Menai, and filling the Dee, the Mersey, and the Ribble.

The *western portion of the stream*, after passing the Saltees, runs nearly in the direction of the Tuskar, sets sharply round it, and then takes a N.E. $\frac{1}{2}$ N. direction, setting fairly along the coast, but over the banks skirting the shore, so that vessels tacking near the inner edge of the sands on the flood, and on the outer edge on the ebb, have been carried upon them and lost, especially upon the Arklow and Codling Banks. Abreast of the Arklow is situated that remarkable spot in the Irish Channel, where the tide scarcely either rises or falls. The stream notwithstanding sweeps past it at the rate of 4 knots at the springs, and reaches the parallel of Wicklow Head. Here it encounters an extensive projection of the Codling bank; and while the outer portion takes the circuit of the bank, the inner stream sweeps over it, occasioning an over fall and strong rippling all round the edge, by which the bank may generally be discovered. Beyond this point the streams unite and flow on towards Howth and Lambay, growing gradually weaker as they proceed, until they ultimately expend themselves in a large space of still water situated between the Isle of Man and Carlingford. There we have not been able to detect any stream; for there another remarkable phenomenon occurs—the water rising and falling without having any perceptible stream. This space of still water is marked by a bottom of blue mud. Such is the course of the flowing water of the Southern Channel.

Western Branch sets over the Irish banks.

Off Arklow, no rise or fall.

Codling Bank.

Stream ends off Carlingford. No stream there.

In the North Channel the stream enters between the Mull of Cantyre and Rathlin Island simultaneously with that passing the Tuskar into the Southern Channel, but flows in the contrary direction. It runs at the rate of 3 knots at the springs, increasing to 5 knots near the Mull, and to 4 near Tor Point on the opposite side of the channel. The eastern branch of this stream turns round the Mull towards Ailsa and the Clyde, a portion passing round Sanda up Kilbrennen Sound and Loch Fyne. The main body sweeps to the S. by E., taking nearly the general direction of the Channel, but pressing more heavily on the Wigtonshire coast; off which it has scooped out a remarkable ditch, upwards of 20 miles long by about a mile only in breadth, in which the depth is from 70 to 100 fathoms greater than that of the general level of the bottom about it. Near the Mull of Galloway the stream increases in velocity to 5 knots; the eastern portion turns sharply round the promontory towards the Solway, and splits off St. Bees Head, one portion running up the Solway, and the other towards Morecambe Bay.

Northern Stream from Rathlin to the Clyde.

The *central portion* midway between the Mull of Galloway and the Copeland Island presses on towards the northern half of the Isle of Man; and while one portion of it flows towards the Point of Ayr, the other makes for Contrary Head, and is there turned back to the N.E. at a right angle nearly to its early course. Passing Jurby Point, it re-unites with the other portion of the stream and they jointly rush with a rapidity of from 4 to 5 knots round the Point of Ayr, and directly across all the banks lying off there, and catching up the stream from the south channel off Maughold Head, they hurry on together towards that great point of union, Morecambe Bay. This bay, the grand receptacle of the streams from both Channels, is notorious for its huge banks of sand, and also remarkable for a deep channel scoured out by the stream, and known as the Lune Deep, which is the great beacon to all vessels bound to that place.

Central portion of this stream sets to Isle of Man and Morecambe Bay.

Lune Deep.

We have now only to speak of the *western limit* of the stream, which was left off Tor Point running at a rate of 4 knots off the pitch of the point. Hence it strikes directly towards the Maidens, boiling over the Highlander and Russel Rocks, and other reefs in the vicinity of that

Western branch of N. stream to Maidens and Belfast.

dangerous group ; and takes the direction of the coast again from Mull Island to Black Head, at the entrance of the Lough of Belfast, which fills.

Belfast Lough. The portion of the stream which sets into Belfast Lough splits at Grey Point ; one portion flowing up towards Garmoyle, while the other bends back along the shore of Bangor, Groomsport, and Orlock, and blends with the general stream which has come on from the Maidens and Blackhead in nearly a straight line, and passes with it through the sounds of the Copeland Islands. Hence it proceeds along the coast, brushes the South Rock, and runs on towards St. Johns Point ; off which the stream, like that coming from the southward, expends itself in the large space of still water, which remains almost undisturbed although pressed upon by streams from various quarters.

Ingoing Streams. Such is a general description of the streams in the Irish Channel, which are produced by the flowing of the water, or which, for the purpose of distinction, we may designate the *inging streams*.

Outgoing Streams. The ebbing or *outgoing streams* do not materially differ from the reverse of those, except that in the southern channel they press rather more over towards the Irish coast.

Limits of the above Streams. These observations do not, however extend beyond the points where the Channels begin to open out, that is beyond a line joining Rathlin and the Mull of Cantyre on the North, and the Saltees and Pembroke on the South. Outside of these limits, the waters diverge right and left ; that on the north joining the stream from Jura, and turning sharp round Rathlin ; that on the south, speaking now of the outgoing stream, sweeps past St. Davids Head into the Bristol Channel on one side, and on the other rounds the Tuskar, and passes on to Waterford.

**TABLE SHOWING THE MAGNETIC DIRECTION AND RATE (AT SPRINGS)
OF THE TIDAL STREAMS IN THE IRISH CHANNEL.**

In the following Table, the direction of the stream as it runs at the middle of the tide or at its greatest strength, is given at four places upon lines connecting well known headlands, viz., at 5 miles from the shore, on each side of the channel, and at a third of the distance across the channel from each of those headlands. The names of the places will be found in the marginal columns; and in the adjacent column, a brief description of the course of the streams in the immediate vicinity of each headland. The western part of the stream will be found on the left-hand page, and the eastern half on the right-hand page. *Explanation.*

To use the table, take the line nearest to your position, and at the distance across the Channel which answers best to your distance from the land, take out the direction of the stream from its column; or if the place of the ship falls between two divisions, take the mean of the two directions given in the columns for the direction of the stream at that time. To know when the stream will turn, look in the previous Tide Tables for the time of high water at Liverpool, for the day, and about 15 minutes after that time the stream will begin to *set out* in both the North and the South Channels, and will run in that direction until about 45 minutes before low water, when the general slack water begins. The slack water in the offing is usually spread over an interval of an hour—from the cessation of one stream to the beginning of the next.

In these tables { F stands for *flood* or *rising* tide at Liverpool.
 { E stands for *ebb* or *falling* tide at Liverpool.

As a rough general rule, in the fair way of the Channel a vessel will be carried 9 miles by the stream in a whole tide at springs, and at neaps about 6 miles; but near to the land on either side, or to the banks, the rate of the stream greatly increases.

The rates given in the table which follows are at spring tides; and in order to adapt them to neaps, one third may be subtracted from them.

TABLE showing the DIRECTION and RATE (at SPRINGS

Position.	Remarks on the Tides near the Land.	Magnetic Direction				
		From	5 Miles.	1/2 over.		
On a line joining the Tuskar and St. Davids Head.	The stream curves with the land and slacks in shore 1 1/2 hours before the offing, and inside the Long Bank 2 1/2 hours before Liverpool, the stream setting over the bank N. by W. & S. W.	Tuskar -	N.E. 3/4 E. S.W. 3/4 W.	Rate. 3 3	N. E. by E. 1/4 E. s. w. by w. 1/4 w.	Rate. 2 3/4 2 1/2
On a line joining the Arklow Light Ship and Bardsey Island.	Near the Arklow bank the stream slacks half an hour before it does in the offing, and inside the Banks generally an hour and upwards before the offing.	Arklow Light Ship.	N.E. 1/2 N. S.W. by S.	3.6 3.6	N.E. 1/4 N. S.W. 1/2 S.	3 1/2 3 1/2
On a line joining the Kish Light Ship and Holyhead.	The stream slacks at the Kish upwards of half an hour before the offing, and then bends inwards, towards the bay, setting over the Kish bank; further in shore it turns 1 1/2 hours before the offing, and 2 hours close in shore.	Kish Light Ship.	N.N.E. S.S.W. 1/4 W.	2.0 2	N.N.E. S.S.W. 1/4 W.	2 1/2 2 1/2

In approaching Holyhead be guarded against the tides which run very strong near the Headlands.

At 7 miles off the South Stack the stream runs 2 1/2 knots at springs.
At 5 miles ditto ditto 3 to 3 1/2 knots at springs.
At 2 miles ditto ditto 5 knots at springs.

The neaps run about two thirds of these rates. In the channel the direction of the flood is about N.E. by N., and near the Stack N.E. or N.E. 1/2 E. towards the Skerries. Off the Skerries, that is, outside them, the flood turns more easterly, or runs E.N.E., and to the northward of the Skerries due east, or E. 1/2 N.

Off the South Stack there is a race occasioned by the meeting of the tides, but increased by some uneven rocky ground off the Stack. It begins about the

Position.	Remarks on the Tides near the Land.	Magnetic Direction				
		From	5 Miles.	1/2 over.		
On a line joining the Calf of Man and the Skerries.	The flood stream meets the northern stream close to the Calf, and both run along the land to the eastward.	Calf of Man.	E. 3/4 S. W.N.W. 1/2 W.	Rate. 2 1/2 2 1/2	E. 1/4 N. W. 1/4 S.	Rate. 1 1/2 1 1/2
On a line joining Rockabill and the Calf of Man.	From Rockabill to the northward the stream sets fair, taking nearly the direction of the coast, and passes on to St. Johns Point, when it encounters the stream from the North Channel; near here the stream turns to the westward, and bends in taking the curve of Dundrum Bay, which must be guarded against.	Rockabill -	N. by E. S. by W.	1.0 1 1/4	N.E. 1/4 E. S.S.W.	1/2 1/2

of the TIDAL STREAMS in the IRISH CHANNEL.

of the Stream.						Remarks on the Tides near the Land.	Position.
	$\frac{1}{2}$ over.		5 Miles.		From		
F	N.E. $\frac{1}{2}$	Rate. $2\frac{1}{2}$	N.E. $\frac{3}{4}$ E.	Rate. $3\frac{1}{2}$ to 4	St. Davids Head.	The stream curves with the land, and the flood sets sharply into Cardigan Bay, sweeping more	On a line joining St. Davids Head and the Tuskar.
E	S.W. $\frac{1}{2}$ W.	$2\frac{1}{2}$	S.W. $\frac{3}{4}$ W.	4			
and more in as you near the land. There is consequently an in-draught into this bay on both ebb and flood.							
F	N.E. by N.	$3\frac{1}{2}$	N.N.E. $\frac{1}{2}$ E.	3	Bardsey Island.	The stream curves sharply round Bardsey, and slacks 1h. 20m. in the Bardsey Sound before it does in the offing; the flood setting strong into Caernarvon, and the ebb strong into Cardigan Bay, and <i>vice versa</i> .	On a line joining Bardsey Island and the Arklow Light Ship.
E	S.W. $\frac{1}{2}$ S.	3	S.S.W. $\frac{1}{2}$ W.	$2\frac{1}{2}$			
F	N.N.E. $\frac{3}{4}$ E.	$2\frac{1}{2}$	N. by E. $\frac{1}{2}$ E.	$3\frac{1}{2}$	Holyhead -	In passing Caernarvon Bay the stream curves with the bay more and more as you near the bight, setting into the bay on one side and out at the other end, near Holyhead Bay; the stream sets directly for the Skerries, sweeping into Holyhead Bay when inside a line, joining the North Stack and Skerries, and in the centre of the bay splits, one part setting sharply over the Platters and round Carmel Head, the other running for the Fenwick Rock and Penryn.	On a line joining Holyhead and Kish Light Ship.
E	S.W.	$2\frac{1}{2}$	S.W. $\frac{1}{2}$ S.	3			

first quarter ebb and flood, at first close in with the shore, and gradually increases in strength, extending to seaward in a direction between N.W. and W.S.W. from the lighthouse, according to time of tide; about the last quarter tide it begins to subside. With strong winds blowing against the tide, the race is heavy, especially about half tide, and even dangerous at that time to small deep laden vessels, so that they should either go outside altogether or pass between it and the Stack (close to the latter). North and N.W. winds occasion the heaviest seas; at a distance of 2 miles from the Stack the race is no longer felt, and by keeping the Skerries to the eastward of N.E. by E. $\frac{1}{2}$ E. a vessel will pass outside of it. Off the North Stack also there is a race after half tide, and although not dangerous at any time, it had better be kept clear of in heavy weather, as the seas break short.

of the Stream.						Remarks on the Tides near the Land.	Position.
	$\frac{1}{2}$ over.		5 Miles.		From		
F	East	Rate. 2	E. $\frac{1}{2}$ N.	Rate. 3	Skerry Lighthouse.	From the Skerries the stream sweeps over the Coal Rock, and runs on thence to Lynus and Liverpool in nearly a direct line; but at 10 miles off shore it takes a more northerly direction, and strikes off for the Ribble and Morecambe Bay; near Lynus it curves to the southward, and runs for Priestholm and Great Orme Head; at half tide the stream slacks in Red Bay, and turns to the northward, and off Lynus meets the true tide, and forms a race.	On a line joining the Skerries and the Calf of Man.
E	W. by S.	$1\frac{1}{2}$	W. $\frac{3}{4}$ S.	3			
F	E. $\frac{1}{2}$ N.	$1\frac{1}{2}$	S.E. by E.	2	Calf of Man	Near the Calf, and to the northward, the flood sets to the southward, and the ebb to the northward; between the Calf and Rockabill the stream is very slack, being scarcely perceptible midway.	On a line joining the Calf of Man and Rockabill.
E	W. by S.	$1\frac{1}{2}$	N.N.W. $\frac{1}{2}$ W.	$1\frac{1}{2}$			

TABLE showing the DIRECTION and RATE (at Springs)

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.	$\frac{1}{2}$ over.			
On a line joining Calf of Man and Walney Island.	Near the Calf, and eastward to Langness Point, the stream runs strong, and near the land bends to the northward, and passes Douglass Head on to Manghold Head, where it is turned to the East and S.E. by the northern stream.	Calf of Man	E. $\frac{1}{2}$ N. W. $\frac{1}{2}$ N.	Rate. 3 $\frac{1}{2}$ 3 $\frac{1}{2}$	East West	Rate. 2 2	F E
On a line joining St. Johns Point and Peel (Isle of Man).	The streams from the north and south channels meet off St. Johns Point. Near the land the stream runs 2 knots at springs, but at a distance there is scarcely any tide. Off the mouth of Lough Strangford, on a south bearing, the outset will be felt at a distance of 3 $\frac{1}{2}$ miles, sweeping in a curve to the N.E. with the ebb, and to the S.W. with the first of the flood, forming a race: the outset continues to run 2 hours after low water.	St. Johns Point.	S.W. by W. $\frac{1}{2}$ W. N.E. by E.	1 $\frac{1}{2}$ 1 $\frac{1}{2}$	S.W. $\frac{1}{2}$ W. N.E. $\frac{1}{2}$ N.	0 $\frac{1}{2}$ Drain	F E
On a line joining Peel and Mull of Galloway.	- - -	-	E. $\frac{1}{2}$ N. W. $\frac{1}{2}$ N.	1 1 $\frac{1}{2}$	E. by S. W.N.W. $\frac{1}{2}$ W.	1 $\frac{1}{2}$ 1 $\frac{1}{2}$	F E

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.	$\frac{1}{2}$ over.			
On a line joining the Point of Ayr and Burrow Head.	Near the Point of Ayr, in a N.N.W. direction, there is usually a race, especially on the ebb: it takes place upon a bank, which, although shallower than the parts about it, is not dangerous.	Point of Ayr	S.E. by E. $\frac{3}{4}$ E. W. by N.	Rate. 3 $\frac{1}{2}$ 3	E. $\frac{3}{4}$ S. W. by N.	Rate. 2 $\frac{1}{2}$ 3 $\frac{1}{2}$	F E
On a line joining the Point of Ayr and St. Bees Head.	- - -	Point of Ayr	S. $\frac{3}{4}$ E. N.N.W.	2 $\frac{1}{2}$ 1 $\frac{1}{2}$	S. $\frac{3}{4}$ E. N.W. by N.	2 $\frac{1}{2}$ 2	F E

On the line joining Point of Ayr and St. Bees Head are situated the White-stone and King William Banks, which are very dangerous. The tide sets immediately over them, S. by E. $\frac{1}{2}$ E., at a rapid rate, and ought to be carefully guarded against.

The stream sets round the Point of Ayr into Ramsey Bay about the time of low water at Liverpool, and sweeps over the Bahama Bank, and from thence

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.	$\frac{1}{2}$ over.			
On a line joining Copeland Island and Mull of Galloway.	- - -	Copeland Island.	S. $\frac{1}{2}$ E. N. $\frac{1}{2}$ W.	Rate. 2 2	S. by E. $\frac{1}{2}$ E. N. by W. $\frac{1}{2}$ W.	Rate. 2 2 $\frac{1}{2}$	F E

Magnetic Direction and Rate of the

After High Water at Liverpool.

1 Hour.		2 Hours.		3 Hours.		4 Hours.		5 Hours.		6 Hours.	
Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
N. $\frac{1}{2}$ E.		North		N. by W. $\frac{1}{4}$ W.		N.N.W. $\frac{3}{4}$ W.		N.W. $\frac{1}{2}$ N.		S.W. $\frac{1}{2}$ W.	

e TIDAL STREAMS in the IRISH CHANNEL—continued.

Stream.					Remarks on the Tides near the Land.	Position.
$\frac{1}{2}$ over.		5 Miles.		From		
E. by E. $\frac{1}{4}$ E. W.N.W.	Rate. 1 $\frac{1}{2}$	S.E. $\frac{1}{4}$ S. N.W. $\frac{1}{4}$ W.	Rate. 2 2	Walney Island.	The stream sets sharply round Walney Island into Morecambe Bay.	On a line join- ing Walney Island and the Calf of Man.
S. $\frac{1}{4}$ E. Slack	0 $\frac{1}{2}$	S. $\frac{1}{4}$ W. N. $\frac{3}{4}$ W.	1 $\frac{1}{2}$ 1 $\frac{1}{2}$	Peel		
the other turns to the N.E., passes Contrary Head, so called from the set of the tides off it, and runs with an increasing rate along the land to Jurby, and thence to the Point of Ayr.						On a line joining Peel and St. Johns' Point.
S.E. $\frac{1}{4}$ E. by W. $\frac{3}{4}$ W.	2 $\frac{1}{2}$ 2 $\frac{1}{2}$	E.S.E. $\frac{1}{4}$ E. N.W. by W.	3 \cdot 0 3 $\frac{1}{2}$	Mull of Gal- loway.	Off the Mull of Galloway the stream attains its greatest strength, and occasions a race off the head; but there is usually a slack very close to the shore, of which steamers who are acquainted take advantage. Between the Mull and Burrow Head the stream bends to the northward, and finally takes the curve of the bay of Morecambe, setting sharply into the bay round the Mull, and out round Burrow Head.	

Stream.				Remarks on the Tides near the Land.	Position.
5 Miles.		From			
East N.W. $\frac{3}{4}$ W.	Rate. 4 4	Burrow Head		On a line join- ing Burrow Head and Point of Ayr.
E. by S. N.W. $\frac{1}{4}$ N.	1 $\frac{3}{4}$	St. Bees Head		Between King William Bank and St. Bees Head the stream is slack, but near St. Bees begins to run, one part passing up the Solway, the other going on towards Walney.	On a line join- ing St. Bees Head and Point of Ayr.

... goes on to Maughold Head, where it meets with the tide from the southern channel. At half flood the stream at the Bahama runs towards Ramsay, and then runs to the north-west the rest of the tide.* A few miles westward of this spot, latitude 54° 18' N. and longitude 4° W., the streams from the Calf of Man, and that which had passed over the Whitestone Bank, meet and thence run directly for Walney Island.

Stream.		Remarks on the Tides near the Land.	Position.
5 Miles.	From		
E. $\frac{1}{4}$ E W. $\frac{1}{4}$ W.	Rate. 3 3 Mull of Gal- loway.	- - - - -	On a line joining Mull of Gallo- way and Cope- land Island.

: the Bahama Light Vessel.

Before High Water at Liverpool.								
4 Hours.		3 Hours.		2 Hours.		1 Hour.		
Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
	S. 1/4 W.		S.W.		N.W. 1/4 W.		N. by E. 1/4 E.	

* See Bahama Light Vessel.

TABLE showing the DIRECTION and RATE (at SPRING TIDES)

Copeland Islands and Lough of Belfast.

The main body of the stream, ebb and flood, crosses the entrance of this Lough, takes a curve from the Copeland Islands to Blackhead, and near the islands gains strength of 5 knots; this curve bends more and more in until it stretches from Whitehead to Grey Point, when it divides, one part of the flood running up Garmoyle, the other bending back and running towards Orlock, and near this place will carry a vessel upon the Briggside if not guarded against.

The first of the flood sets through the Copeland Sound and between the islands at a rapid rate, and care must be taken not to be swept into the intricate pass between the Copeland Islands. At half tide all the inshore part of the tide within 1½ miles of the coast south of the Copelands slacks, and shortly turns to northward and runs for 3 hours, whilst the stream in the offing is still going to the southward; so that from Ballyferris Point to Foreland Point, quite close in, the stream runs 9 hours to the northward and only 3 to the southward.

Position.	Remarks on the Tides near the Land.	Magnetic Direction			
		From	5 Miles.	Rate.	½ over.
On a line joining Corsewall Point and Sanda Sound.	Near Corsewall the stream gains strength, and close in takes the curve of the land, the flood setting to the S.W. round the lighthouse, and the ebb to the N.E. <i>versâ</i> .	Corsewall Point.	S. ½ E. N.N.W.	1½	S.E. ½ S. 1½
				1½	N.W. ½ N. 1½
On a line joining Muck Island and Corsewall Point.	Close to Muck Island the stream attains great strength, the flood turning round Blackhead into the Lough of Belfast, but at a few miles off shore it runs straight on to the Copeland Islands.	Muck Island.	S. by E. ¼ E. N. by W. ¼ W.	1½	S. by E. ¼ E. 1½
				1½	N. by W. ¼ W. 1½

The tides off Muck Island run from 3½ to 4½ knots close in, and occasion a high and heavy breaking sea at the springs; and in blowing weather there are runnels also off both Blackhead and Whitehead, and also the Gobbins; with the ebb there is an eddy from half tide, close in with the shore, which may be to the advantage of by steamers at all times, and by sailing-vessels with a leading wind but it does not extend sufficiently far off for sailing-vessels to benefit by it with a working wind, as they would be in danger of getting on the rocks if they missed stays.

Position.	Remarks on the Tides near the Land.	Magnetic Direction of the Stream.			
		From	½ over.	Rate.	½ over.
On a line joining Tor Point and Mull of Cantyre.	Close off Tor Point the flood runs upwards of four knots at springs.	Tor Point	S. by E. N. by W.	4	S. by E. ¼ E. 4
				3½	N. by W. ¼ W. 3½

TIDAL STREAMS in the IRISH CHANNEL—*continued.*

3rd quarter of the flood having turned to the northward, meets the tide in the Sound off the Deputy Reef, and they jointly strike off for the south of the Copeland Islands and pass over the Bushes, and thence through the channel between the Islands.

An eddy under Mew Island at this time rushes with great speed to the north until it meets the true tide, and with it forms a race which sailing-vessels should avoid; upon the ebb a similar race occurs, but to the N.E. of Mew Island.

The last of the flood goes to the northward through the Sound, and splits off at the south end of the Copeland, and one part runs for Mew Island, throwing off eddies between the islands.

About the Copeland Islands the eddies are very strong, and at night a vessel should be sure that she is outside the drift of the point of Mew Island.

Stream.		From	Remarks on the Tides near the Land.	Position.
8 Miles.	Rate.			
E.S.E. W. by W.	2 1½	Sanda Island	The tide runs fast past Sanda Island, and is variable in its direction. Off the western end of the island it splits; the outer part passing on for the Clyde, and the other going inside the island, and up Kilbrennen Sound, as mentioned below.	On a line joining Sanda Island and Corsewall Point.
S. ¼ E. N. ¾ W.	1½ 1¼	Corsewall Point.	- - - - -	On a line joining Corsewall Point and Muck Island.

After passing Whitehead, the tide slacks considerably as you enter the Lough. At the flood there is a strong eddy under Muck Island, which will be found useful to steamers and even sailing-vessels beating along this coast; with a fair wind they will do well to keep close in with the shore hereabout, as the strength of the flood strikes off from Muck Island in a S.E. direction, till it meets the stream which passes the eastern side of the Maidens, when it takes a channel direction; the meeting of these two tides appear to have occasioned a deep ditch, which will be found from 90 to 100 fathoms water.

Remarks on the Tides near the Land.	Position.
At the Mull of Cantyre the stream runs 5 knots, and occasions a heavy dangerous sea in bad weather; with either tide, quite close in, there is an eddy. From the Mull of Cantyre the flood takes a direction nearly for Sanda Island, and divides off its western end: one part passing inside the island and up Kilbrennen Sound, the other running on for the Clyde.	On a line joining Mull of Cantyre and Tor Point.

THE TIDES NEAR RATHLIN ISLAND.

BY RICHARD HOSKYN, MASTER R.N.,

In charge of the Survey on the North-east Coast of Ireland.

- Rate of tide.* ABOUT Rathlin Island the tides are very rapid, in the Sound they run from 4 knots at neaps to $6\frac{1}{4}$ knots at springs, occasioning strong eddies along the shores, with heavy overfalls off all the headlands.
- Eddy from Tor Point through the Sound.* On each side of Tor Point there is an eddy which at half tide gradually extends from the shore, at the last quarter of the Channel flood this eddy goes to the westward through Rathlin Sound, causing the stream to make there $1\frac{1}{2}$ hours sooner than it does to the northward of the island; by taking advantage of these eddies a ship from southward may carry 9 hours tide with her through Rathlin Sound.
- Eddy on south shore.* To the westward of Fair Head all along the south shore of the Sound as far as Sheep Island there is an eddy with both streams, commencing at half tide. Carrickvaan Rock lies at the junction of the eddy and the streams.
- Ebb stream.* During the first hour and half, the ebb stream sets round the Point into Church Bay, but after high water at Liverpool, when the general stream north of the island has made to the westward, and it has attained a rate of $6\frac{1}{4}$ knots through the Sound, an eddy begins in Church Bay, setting from the Bull Point towards the Rue, and meeting the true tide about a mile to the westward of the latter, where the bottom is very irregular, a great overfall is occasioned, called Slough-na-nan which may be attended with danger to small vessels.
- Eddy in Church Bay.* The eddy from Church Bay has now forced the main stream in a more southerly course, with contracted limits it sets from Rue Point towards the Carrickvaan Rock, whence it shoots off in a N.W. direction towards the Bull Point at the west end of Rathlin, meeting there the stream from the north side of the island setting to the S.W.
- Dangerous overfall.* The flood or eastern stream does not begin in the middle of the Sound until it is low water at Liverpool, although, as before observed, the eddy along the south shore commences at half tide. There is no slack water preceding the flood stream; in the eastern part of the Sound at low water it sets south $2\frac{1}{2}$ knots, in the western part at the same moment it sets north $1\frac{3}{4}$ knots, eddying round at each station in opposite directions. The stream soon becomes general, setting fair through the Sound, rushing out of Church Bay past the Rue with great force, including the eddy before alluded to, it sets for 10 hours across Church Bay to the westward. During the flood stream there is an eddy to the eastward of the island, extending $2\frac{1}{2}$ miles from the shore, setting back on the island at the junction of the eddy and true streams there are great overfalls at Altacarry Head, and again off the Rue as mentioned above.
- Direction of ebb.* With a commanding breeze there is no danger in the navigation of Rathlin Sound, but in light winds great vigilance is necessary to avoid being caught in the eddies or overfalls.
- Flood stream.* Off Bengore Head, at a mile distant, the stream turns about 15 miles after high and low water at Liverpool; springs run 3 knots, the ebb setting W.N.W. and the flood E. b. S. In the bays on each side of the island heads an eddy begins when the stream in the offing has run half its course.
- Eddy to eastward of Island.*
- Navigation of Sound.*
- Streams off Bengore Head.*

Skerry Islets the *ebb stream* sets fair through the anchorage to the westward, attaining a velocity of 3 to $3\frac{1}{2}$ knots in between Ramore Head and the Carr Rocks, and creating a boisterous sea.

Streams near the Skerry Islet.

The stream sets from Ramore Head towards the Carr Rocks; when the Sound is entered it sets fair through.

When it sets down on the Little Skerry, while the ebb runs northward through the Sound.

In the anchorage under the Great Skerry there is little tide felt, and it is slack water at half tide, on the ebb with the last ebb on the north side of the rocks the stream runs with a velocity of 1 knot.

Proceeding to the westward towards Lough Foyle the tide loses strength, north of the mouth of the Bann, 3 miles off shore the rate at springs is $1\frac{3}{4}$ knots.

To the westward.

An eddy tide all the way along the shore from the Skerry to the mouth of the Bann, commencing at half tide, the line of separation with the main stream being marked by a strong rippling.

Eddy.

North of Port Stewart the channel stream turns to the north an hour and 40 minutes after low water at Liverpool, or at the same time on the adjoining shore, and to the westward 31 minutes after low water at Liverpool, or three quarters of an hour before low water on the adjoining shore, so that, on this part of the coast, the tide (with reference to its head at Liverpool) being nearly reversed, (what to a person watching the rise and fall of the tide appears at first sight so anomalous) the whole of the ebb is occasioned by the flood coming from the ocean, while the flood comes from the opposite

Off Port Stewart.

High and low water not occasioned by tidal stream,

but by the tidal stream to the head of the tide at Liverpool, and the times of high water to the undulation of the tide wave, the anomaly disappears.

but by tidal wave.

Off the coast to the westward of Fair Head is subject to a ground swell. In fine weather the commencement of the east-going stream is marked by the sudden appearance of the swell, resuming again the same state of quiet when the west-going stream makes.

Ground swell.

SECTION II.

THE TIDAL STREAMS OF THE ENGLISH CHANNEL, WITH T.
SHOWING THEIR COURSE AND RATE AT EVERY HOUR OF THE
AT DOVER.

*Streams turn
with the tides of
Dover.*

IN the English Channel, as before stated (page 120), the time of water *at Dover* is to be taken as the standard, so that whenever the time of the turn or the direction of the stream is required known, the time of the ship is to be compared with the time of water for the day at the standard place, and the interval sought table which accompanies these remarks, and in the column answering the ship's position will be found the information required.*

*Tidal Compart-
ments.*

In these tables it has been necessary to class the information under heads answering to the various compartments of the Channel, the courses of the stream in the mixed tides are so changeable that a different stream will be found running at a place but little removed from another in the same portion of the Channel. The seaman must therefore look in which compartment according to his latitude and longitude his ship is sailing, and in which quarter of that compartment, N.E., N.W., S.E., or S.W., and then enter the table for the direction of the stream.

*1st Compart-
ment.*

The 1st compartment, as previously stated (page 120), comprises the approach to the English Channel *westward of a line joining the Start and Scilly.*

*2d Compart-
ment.*

The 2d compartment comprises a space eastward of the mentioned line from Ushant to Scilly, and as far as a line joining the *Start and the Casquets.* In this part of the Channel there is a mixed tide, partaking of the joint directions of the Channel and the streams.

*3d Compart-
ment.*

The 3d compartment is bounded on the west by the line joining the *Casquets and the Start*, and on the east by a line from *Beachy Head to Dieppe*, having the Baie de la Seine on the south. As soon as a vessel passes to the eastward of the Start and Casquets she gets the true Channel stream which sets straight up and down the Channel the fairway, and will always carry a vessel *towards Beachy Head* when the water is *rising at Dover*, and *from it* while it is *falling there.*

*4th Compart-
ment.*

The 4th compartment comprises the Gulf of St. Malo, and the bay which from its magnitude and large tides exercises a powerful influence over the navigation of that part of the Channel in its immediate vicinity, and the seaman must be especially on his guard when drawing near this locality. With the *falling water* at Dover the stream sets *into this Gulf* on both sides,† which the prevalence of westerly winds is said to increase, and with the *rising water* at Dover it sets *across out of the Gulf*, the north-eastern part of the stream sweeping round the *Casquets* towards Alderney, and through the Russel and the Channels about Guernsey towards the race of Alderney.

*5th Compart-
ment.*

The 5th compartment contains the great bight on the south side of the Channel eastward of Cape Barfleur, known as the Baie de la Seine. With the *rising water* at Dover the stream sets sharply round Cape Barfleur *into the bay*, curving more and more as the depth of the bay is gained until it finally takes the sweep of the shore. With the *falling tide* the western half of the bay is partly in eddy, and the tide runs in all that part nearly an hour before high water at Dover, whilst in the eastern half of the bay it runs about half an hour longer than at

* The time at ship is to be corrected for the longitude of Dover.

† A return of the vessels wrecked on the Channel Islands shows that the greater part of them came ashore about the end of the falling water at Dover.

ere a ship beating up Channel towards the end of a rising tide may prolong the tide in her favour by standing close over French Coast eastward of Havre. On approaching Boulogne, at the beginning of a *rising tide*, great attention should be paid to the direction in the tables, as the streams hereabout meet and run down upon the French Coast, so that a ship, which on the east side would at this time have a stream setting straight up the Channel, here encounters one upon her beam, sweeping her down the Somme, and hence probably the cause of some of the disastrous losses which have occurred in this part of the Channel. This compartment is between Beachy Head and the North Foreland, the Somme and Dunkerque. In this space the streams from the English Channel and North Sea *meet* while the water is *rising* at Dover, and while it is *falling* there. The point of union and separation is ever, stationary, but moves from west to east both on the tide of falling water. For instance, an hour after high water at Dover the separation begins off Beachy Head; in two hours it has reached Rye, in three hours Rye, and so it creeps on until at low water it has reached the line extending from the North Foreland to Dunkerque. At the time the offing streams on both sides have done, and it is slack water in the North Sea and English Channel as far as the true tide is concerned, but the stream does not at this time cease in the intermediate tide. As the water at Dover begins to rise, the stream on either side sets *with* Dover, and that from the North Sea consequently *goes with the tide*, which had not yet ceased running to the westward, while, on the other, the Channel stream, *opposes* it, and this opposition continues throughout the rising tide at Dover; the point of meeting gradually moves to the eastward as the tide advances on the shore.* About the time when the water at Dover has done rising, the line of meeting has reached the North Foreland, and the streams are now slack over the Channel, running east and west, leaving the intermediate stream running alone to the eastward. The next hour finds the offing streams made good to the east and west, so that now the intermediate stream falls in with the North Sea stream and goes with it, whilst on the west it separates from the Channel stream, splitting at the same point, Beachy Head, as

6th Compartment.

For the general description of the course and routine of the tidal currents of the English Channel and intermediate tide, a careful perusal of the tables will enable the reader the more readily to understand the meaning of the words and tables annexed.

The place of *meeting* begins off Beachy Head at *five hours before* high water on the east side, and that of the *separation* at *one hour after* high water; the place of *four hours after* high water is nearly the same as that of the separation at *two hours after*; and so on with the subsequent hours.

TABLE showing the MAGNETIC DIRECTION of the STREAM in the ENGLISH CHANNEL at every HOUR of the TIDE at DOVER.

COMPARTMENT I.

Westward of a Line joining Ushant and the Land's End.

Hours.	North Side of Latitude 49°00 N.						REMARKS.	South Side of the Channel.
	West part.	Rate.	Near Scilly.	Rate.	Seven Stones.	Rate.		
After High Water, Dover.	1 W.N.W. ¼ W.	Greatest rate, springs, 1'50 knots.	N.N.W. ½ W.	Greatest rate, springs, 1'50 knots.	N. ¼ W.	Greatest rate, springs, 1'60 knots.		W.
	2 N. ½ W.		N. ½ W.		N.N.E.			N. by N.
	3 N.E. ¼ E.		N.N.E.		N.E. ¼ N.			E.N.E.
	4 E.N.E. ¼ E.		N.N.E.		N.E. ½ E.			E.N.E.
	5 E.N.E. ¼ E.		N.E. by E.		N.E. ¼ E.			N.E. by E.
	6 E. ¼ S.		E. ¼ S.		E.N.E. ¼ E.			Tide
Before High Water, Dover.	5 S.E. by E. ½ E.	Greatest rate, springs, 1'50 knots.	- - -	Greatest rate, springs, 1'50 knots.	S. ¼ W.	Greatest rate, springs, 1'60 knots.		S. by S.
	4 S. ½ E.		South.		S.S.W. ¼ W.			Dra
	3 S.S.W. ¼ W.		S.W.		S.S.W. ½ W.			S.W.
	2 S.W. by W.		S.W. by W.		S.W. ½ S.			S.W.
	1 W.S.W. ¼ W.		S.W. by W.		W.S.W.			S.W. by

COMPARTMENT II.

Between { A Line joining the Land's End and Ushant,
" " the Casquets and Start, and
" " the Casquets and Sept Iles.

Hours.	North Side of the Channel.						REMARKS.	South Side of the Channel.		
	West part.	Rate.	Centre.	Rate.	East part.	Rate.		West part.	Rate.	Centre.
After High Water, Dover.	1 W.N.W. ¼ W.	Greatest rate, springs, 2'00 knots.	W. ¼ N.	Greatest rate, springs, 1'50 knots.	W. ½ N.	Greatest rate, springs, 2'25 knots.	{ W. ½ S. near Hurd's Deep. }	W. ½ S.	Greatest rate, springs, 1'50 knots.	W. ¼ N.
	2 Turning.		N.W. by W. ¼ W.		W. ¼ N.			Slack.		West.
	3 N. ¼ E.		W. ¼ N.		West.			East.		Slack.
	4 E. ½ S.		Slack.		S. ½ W.			E. by N.		E.S.E. ¼ E.
	5 East.		E. ½ S.		S.E. ½ S.			E.N.E. ¼ E.		E. ½ S.
	6 E. by S.		E. ½ S.		E.S.E. ¼ E.			E. ¼ N.		S.E. by E. ¼ E.
Before High Water, Dover.	5 E.S.E. ½ E.	Greatest rate, springs, 2'00 knots.	E. by S.	Greatest rate, springs, 1'50 knots.	E. by S.	Greatest rate, springs, 2'25 knots.	{ W. ½ S. near Hurd's Deep. }	E. ¼ S.	Greatest rate, springs, 1'50 knots.	E. by S.
	4 Slack.		E.S.E. ¼ E.		E. ¼ S.			N.E. by E. ¼ E.		Slack.
	3 Turning.		Slack.		E. ½ S.			Slack.		W.N.W.
	2 W. by N.		W. ¼ N.		Turning.			S.W. by W. ¼ W.		Slack.
	1 W. ¼ S.		W. ¼ N.		W.S.W. ¼ W.			S.W. by W.		W. by N.

COMPARTMENT III.

Between { A Line joining Start and Casquets, and
" " Point Ailly and Beachy Head.

Hours.	West part.	Rate.	Centre.	Rate.	East part.	Rate.	REMARKS.	Over Hurd's Deep.	Rate.
After High Water, Dover.	1 W. ¼ N.	Greatest rate, } flood 2'30 } ebb 2'40 } knots.	W.N.W. ¼ W.	Greatest rate, } flood 3'6 } ebb 3'3 } knots.	Turning.	Greatest rate, } flood 3'00 } ebb 2'40 } knots.		W. ½ S.	Greatest rate, } flood 2'15 } ebb 2'40 } knots.
	2 W.N.W. ½ W.		N.W. by W. ¼ W.		W.N.W. ½ W.			W. ½ S.	
	3 W. ¼ N.		N.W. by W. ¼ W.		W.N.W. ¼ W.			W. ¼ S.	
	4 W. ¼ S.		W.N.W.		W. ¼ N.			W.S.W.	
	5 W. ¼ S.		W.N.W.		W. by N.			W.S.W. ¼ W.	
	6 N.N.E. ¼ E.		W.N.W. ¼ W.		W. by N.			Slack.	
Before High Water, Dover.	5 E. ¼ S.	Greatest rate, } springs - - - }	E.S.E.	Greatest rate, } springs - - - }	E.S.E. ¼ E.	Greatest rate, } springs - - - }		E. ½ S.	Greatest rate, } springs - - - }
	4 E.S.E. ¼ E.		S.E. by E. ¼ E.		E.S.E. ¼ E.			E. ½ S.	
	3 E.S.E. ¼ E.		S.E. by E. ¼ E.		E.S.E. ¼ E.			E. ¼ S.	
	2 E.S.E. ¼ E.		S.E. by E. ¼ E.		E.S.E. ¼ E.			E. ½ N.	
	1 E.S.E. ¼ E.		E.S.E.		E. ¼ S.			E.N.E.	

COMPARTMENT IV.

Entrance of Gulf of St. Malo on a line joining Brehat Island and S.W. line of Guernsey Island.

Hours.	12 miles from Brehat Island.		12 miles from Guernsey Island.		REMARKS.	Near S.W. Point, Guernsey Island.		4 miles W. by S. from Casquets.		4 miles W.N.W. of Cape La Hague.	
	Course.	Rate.	Course.	Rate.		Course.	Rate.	Course.	Rate.	Course.	Rate.
Water, Dover.	1 N.W. by W.	Greatest rate, springs, uncertain knots.	W. ¼ N.	Greatest rate, springs, uncertain knots.		W. ¼ N.	Greatest rate, springs, uncertain knots.	W. ¼ S.	Greatest rate, springs, knots.	S.W. by W. ¼ W.	Greatest rate, springs, 5 to 7 knots.
	2 S. ½ W.		S. ¼ W.			S.S.W. ¼ W.		S.W. ¼ W.		S.W. by W. ¼ W.	
	3 S. ¾ W.		S. ¾ W.			S.S.W. ¼ W.		S.W. ¼ W.		S.W. by W. ¼ W.	
	4 S.E. ¼ S.		S.S.E. ¼ E.			S.E. by E. ½ E.		S. by E. ¼ E.		S.W. ¼ S.	
	5 S.E. ¼ S.		S.E. ¼ E.			S.E. by E. ½ E.		S.E. ½ E.		S.V. ¼ S.	
	6 S.E. ½ S.		S.E. ¼ S.			S.E. by E. ½ E.		S.E. ½ E.		N.E. by E. ¼ E.	
Water, Guernsey.	5 S.E. ¼ E.	Greatest rate, springs, uncertain knots.	S.E. by E.	Greatest rate, springs, uncertain knots.		{ S.E. by E. ½ E. } E. ¼ N.	Greatest rate, springs, uncertain knots.	E. ¼ N.	Greatest rate, springs, knots.	N.E. by E. ¼ E.	Greatest rate, springs, 5 to 7 knots.
	4			{ S.E. by E. ½ E. } E. ½ N.		N.E. ½ N.		N.E. by E. ¼ E.	
	3 N.W. by W.		N.W. ¼ N.			..		N.E. ½ N.		N.E. ¼ N.	
	2 N.W. by W.		N.W. ¼ W.			N. by W. ¾ W.		N.E. by E. ¼ E.		N.E. ¼ N.	
	1 N.W. ¾ W.		W.N.W. ¼ W.			N. by W. ¾ W.		N.W. ½ W.		N.E. ¼ N.	

COMPARTMENT V.

In the Baie de la Seine, south of a line joining Cape Barfleur and Cape Antifer.

Hours.	West Part.	Rate.	Centre.	Rate.	East Part.	Rate.	REMARKS.
After High Water, Dover.	1 N.N.W. ¼ W.	Greatest rate, springs, 4.20 flood 3.70 ebb	N.W. by W. ¼ W.	Greatest rate, springs, 3.20 flood 3.20 ebb	W. ½ N.	Greatest rate, springs, 3.30 flood 3.00 ebb	
	2 N.N.W. ½ W.		N.W. by W. ¼ W.		W. ¾ S.		
	3 N.N.W.		N.W. by W. ¼ W.		W.N.W. ¼ W.		
	4 N.N.W. ¾ W.		N.W. by W. ¼ W.		W. ¼ N.		
	5 N. by W. ¾ W.		N.W. by W. ¼ W.		W. ¼ N.		
	6 Slack.		N.W. by W. ¼ W.		W. ¼ S.		
Before High Water, Dover.	5 S.S.E.	Greatest rate, springs, -	S.E. by E. ¼ E.	Greatest rate, springs, -	W. ¼ S.	Greatest rate, springs, -	
	4 S.S.E.		S.E. by E. ¼ E.		E.N.E. ¼ E.		
	3 S.S.E.		S.E. by E. ¼ E.		E.N.E. ½ E.		
	2 S.E. by S.		S.E. by E. ¼ E.		E.N.E. ½ E.		
	1 S.E. by S.		S.E. by E. ¼ E.		E.N.E. ½ E.		

COMPARTMENT VI.

Between { A line joining Beachy Head and Point Ailly, and the North Foreland and Dunkerque.

1.	REMARKS.	West of	East of	Off Southsand Head.		Off Northsand Head.	
		Line of Separation.		Course.	Rate.	Course.	Rate.
1	{ The Tides separate on a line joining—				Greatest rate, springs, 3.3 knots.		
2	Beachy Head and St. Valery	W. by N.	N.E. by E. ¼ E.	N.E. ¼ E.		N.N.E.	
3	Hastings and Treport	W. ½ N.	N.E. by E. ¼ E.	N.E. ¾ E.		N.N.E.	
4	Hastings and Cayeux	W. ¼ N.	E.N.E.	N.E. by E. ½ E.		N.E. ¼ E.	
5	Folkstone and Calais	W. by S.	E.N.E.	N.E. by E. ¾ E.		E. by S.	
6	South Foreland and Point Gravelines . .	s.w. by w. ¼ w.	N.E. by E. ½ E.				
7	{ Ramsgate and Nieuport, passing over North Sand Head, the South Line of the Falls, and the banks off Nieuport	W. by S.	{ E. ¼ N. and Northward.	{ S.W. ¼ S.		S.S.W.	
8	{ The Tides meet on a line joining—	Tides meet.					
9	Beachy Head and Point Ailly	E.S.E.	s.w. by w. ¼ w.	S.W.		S.S.W.	
10	{ Bexhill and Cayeux, both streams turning down towards the "Somme"	S.S.E. ½ E.	S. by W. ¼ W.	S.W. ¾ W.		S.S.W.	
11	{ The Tides meet on a line joining Rye and the Somme, passing over the Bassurelle, both tides setting to the Somme	S.E. by E ¼ E.	S.W. by W.	W.S.W. ¼ W.	S.S.W.		
12	{ The Tides meet on a line joining—						
13	Dungeness and Touquet Point	E. by N.	W.S.W. ¼ W.	W. ¾ N.	S.S.W.		
14	Do. Dover and Dunkerque nearly	N.E. by E. ½ E.	W.S.W.	N.N.E.	S.S.W.		

SECTION III.

TIDAL STREAMS IN THE NORTH SEA.

*Streams turn
with the Tides
of Dover.*

IN the North Sea the general features of the streams correspond exactly with those of the English Channel, but the *direction* of the stream is reversed. As soon as the intermediate tide is passed, on coming from the westward, a ship enters the True Stream, which extends from the North Foreland to a line joining the Leman and Ower Light on the Texel. To the northward between the Ower and Texel a mixed tide occurs, similar to that which is experienced off the Start, occasioned by the channel stream encountering that of the Offing Stream; and beyond these limits the time of slack water varies with the advance of the tidal hour, as at the entrance of the English Channel; and with this peculiarity also, that in a very short distance there occurs a difference of three hours in the time of slack water.

*Direction of
True Stream.*

The True Stream will always carry a vessel *towards* the North Foreland while the water is *rising at Dover*, and *from it* while it is *falling at the place*.* This stream sets nearly N.E. and S.W., except near the coast where it partakes of the form of the land; and at the entrance of the Thames where it is diverted from its course by the river. The annexed table will show these deviations and the exact course of the stream in the channel, which, for the convenience of reference, is also divided into compartments.

*North Sea
divided into 15
Compartments.*

The 7th compartment comprises the entrance to the Thames; viz. at the Mouse, Sunk, Kentish Knock, and Galloper Light Vessels, at 5 miles north of the North Foreland.

The 8th compartment comprises a space between the mouth of the Thames and the coast of the Netherlands south of 52° N.

The 9th compartment comprises between 52° and 53° N. and the English coast as far as 2° E. and also the Shipwash, Stanford, Saint Nicholas Gat, Cockle, Newarp, and Hasborough Light Vessels.

The 10th compartment comprises between 52° and 53° N. and from 2° to 3° E.

The 11th compartment comprises between 52° and 53° N., and from 3° to 4° E.

The 12th compartment comprises between 52° and 53° N., and from 4° E. to the coast of the Netherlands.

The 13th compartment comprises between 53° and 54° N., and from 1° to 3° E., and the Leman and Ower Light Vessel.

The 14th compartment comprises between 53° and 54° N., and from 3° to 5° E.

The 15th compartment comprises between 53° and 54° N. and westward of 1° E., and the Spurn and Dudgeon Light Vessels.

The 16th compartment comprises from 1° to 8° E. on the parallel 54° N.

The 17th compartment comprises from 0° to 8° E. on the parallel 55° N.

The 18th compartment comprises from 1° to 8° E. on the parallel 56° N.

The 19th compartment comprises from 2° W. to 8° E. on the parallel of 57° N.

The 20th compartment comprises from 3° W. to 3° E. on the parallel of 58° N.

The 21st compartment comprises from 2° W. to 0° on the parallel 59° N.

* Upon the banks lying towards the coast of Holland, between the Texel and Schelde, where there is scarcely any rise or fall of the water, the stream continues nearly 40 minutes longer than in other parts of the channel.

TABLE showing the MAGNETIC DIRECTION of the TIDAL STREAMS in the NORTH SEA from a line joining the SPURN POINT and HELGOLAND to the NORTH FORELAND at every hour of the tide at DOVER.

COMPARTMENT VII.

Entrance to the Thames.

Hours.	Mouse Light Ship.		Sunk Light Ship.		Kentish Knock Light Ship.		5 Miles North of North Foreland.		Galleoper Light Vessel.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 W. by N.	Greatest rate, springs, 2½ knots.	Slack.	Greatest rate, springs, 3½ knots.	N.E.	Greatest rate, springs, 2½ knots.	N.N.W. ½ W.	1'30	N.E. ½ E.	Greatest rate, springs, 2½ knots.
	2 Slack.		N.E. by E. ¾ E.		N.E.		N. ¼ E.	1'30	N.E. by E.	
	3 E. ¾ S.		E.N.E. ¾ E.		N.E.		N.E. ½ E.	1'18	N.E. by E.	
	4 E. ¾ S.		E.N.E. ¾ E.		N.E.		E.S.E. ¾ E.	1'46	N.E. ¾ E.	
	5 E. ¾ S.		E.N.E. ¾ E.		N.E.		E.S.E. ¾ E.	1'60	N.E. by E.	
	6 E. ¾ S.		E.N.E. ¾ E.		N.E.		S.E. ¾ E.	1'45	N.E. by E.	
Before High Water, Dover.	7 E. ¾ S.	Greatest rate, springs, 2½ knots.	..	Greatest rate, springs, 3½ knots.	S.W. ¾ S.	Greatest rate, springs, 2½ knots.	S.S.E. ½ E.	1'30	S. ¾ W.	Greatest rate, springs, 2½ knots.
	8 Slack.		S.W. by W. ¾ W.		S.W. ¾ S.		S. ¾ W.	1'36	S.W. ¾ S.	
	9 W. ¾ S.		S.W. by W. ¾ W.		S.W. ¾ S.		S.W. ¾ S.	1'60	S.W. by W.	
	10 W. ¾ S.		W.S.W. ¾ W.		S.W. ¾ S.		S.W. ¾ W.	1'65	S.W. by W. ¾ W.	
	11 W. ¾ S.		W. ¾ S.		W.S.W. ¾ S.		W.S.W.	1'40	W.S.W.	
	12 W. ¾ S.		W. ¾ S.		W.S.W. ¾ S.		W.S.W.	1'40	W.S.W.	

COMPARTMENT VIII.

Between the mouth of the Thames and the coast of the Netherlands south of 52° N. latitude.

Hour & m.	West of 2° E.		Between 2° and 3° E.		East of 3° E.		REMARKS.
	Course.	Rate.	Course.	Rate.	Course.	Rate.	
After High Water, Dover.	1 N.E. ¾ E.	Greatest rate, springs, { flood 2½ to 3½ knots. ebb 2½ to 3½ }	E.N.E. ¾ E.	Greatest rate, springs, { flood 2½ to 3½ knots. ebb 2½ to 3½ }	N.E. by E. ¾ E.	Greatest rate, springs, 2½ to 2½ knots.	Stream from the Scheldt N.W. by W. to 3° E. turning sharply to N.E. Stream from the Scheldt N.W. by W. to 2½° E. turning sharply to N.N.E. ½ E.
	2 N.E. ¾ E.		E.N.E.		N.E. by E.		
	3 N.E.		N.E.		N.E. ½ E.		
	4 N.E. by E. ¾ E.		N.E. ¾ E.		N.E. ¾ E.		
	5 N.E. ¾ E.		N.E. ¾ E.		N.E. ¾ E.		
	6 N.E. ¾ E.		N.E.		N.N.E. ¾ E.		
Before High Water, Dover.	7 S.W. ¾ S.	Greatest rate, springs, { flood 2½ to 3½ knots. ebb 2½ to 3½ }	S.W. by W. ¾ W.	Greatest rate, springs, { flood 2½ to 3½ knots. ebb 2½ to 3½ }	W.S.W.	Greatest rate, springs, 2½ to 2½ knots.	
	8 S.W.		S.W. ¾ W.		S.W. ¾ W.		
	9 S.W.		S.W.		S.W. ¾ W.		
	10 S.W.		S.W.		S.W. ¾ W.		
	11 S.W.		S.W.		S.W. ¾ W.		
	12 S.W. ¾ S.		S.W.		S.W. ¾ W.		

COMPARTMENT IX.

Between the latitude 52° and 53° N. and the English Coast as far as 2° E. longitude.

Hours.	REMARKS.	
After High Water, Dover.	Stream runs northward.	
1		
2		
3		
4		
5		
Before High Water, Dover.	Stream runs southward.	
6		
7		
8		
9		
10		

Taking the direction of the land, except close to the banks, for which special instructions are necessary.

TIDAL STREAMS

COMPARTMENT IX.—continued.

		Shipwash Light Vessel.	Stanford Light Vessel.	St. Nicholas Gat Light Vessel.	Cockle Light Vessel.	Newarp Light Vessel.	Ha		
Hours.		Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1	E.N.E. ¼ E.		N.E. ¾ N.		N.N.E.		N. ¼ W.	
	2	E.N.E. ¼ E.		N.E. ¾ N.		N.N.E.		N. ¼ W.	
	3	E.N.E. ¼ E.		N.E. ¾ N.		N.N.E.		N. ¼ W.	
	4	E.N.E. ¼ E.		N.E. ¼ N.		N.N.E.		N. ¼ W.	
	5	N.E. by E. ¾ E.		N.E. ¾ E.		N.N.E.		N. ¼ W.	
	6	N.E.		Slack		N. by W.		N. ¼ E.	
Before Low Water, Dover.	5	S.W. ¾ W.		S.W. ¾ S.		S. ¼ E.		S. ¼ E.	
	4	S.W. by W. ¼ W.		S.W. ¾ S.		S. ¼ E.		S. ¼ E.	
	3	S.W. by W. ¼ W.		S.W. ¾ S.		S. ½ W.		S. ¼ W.	
	2	S.W. by W. ¼ W.		S.W. by S.		S. ¾ W.		S. ¼ W.	
	1	S.W. by W. ¼ W.		S.S.W. ¾ W.		S. by W. ¼ W.		S. ¼ W.	

COMPARTMENT X.

Between the latitude 52° and 53° N. and longitude 2° to 3° E.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
After High Water, Dover.									
1	N.E. $\frac{1}{2}$ N.	Greatest rate, springs, 2'25 knots.	N.E.	Greatest rate, springs, 1'60 knots.	N.E. $\frac{3}{4}$ N. *	Greatest rate, springs, { flood 1'40 } knots. ebb 1'40 }	N. by W.	Greatest rate, springs, { flood 2'60 } knots. ebb 3'00 }	* Turn sharply the L. o and C
2	N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{2}$ N.		N.E. $\frac{3}{4}$ N.		N. $\frac{1}{2}$ E.		
3	N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ E.		N.N.E. $\frac{1}{4}$ E.		N.N.E. $\frac{1}{4}$ E.		
4	N.E.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ E.		N. $\frac{1}{4}$ W.		
5	N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N. $\frac{1}{2}$ W.		
6	N.E. $\frac{3}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. by N.		N.N.E. $\frac{1}{4}$ E.		
Before High Water, Dover.									
5	S.W. $\frac{1}{2}$ S.	Greatest rate, springs, 2'25 knots.	S.W. $\frac{3}{4}$ W.	Greatest rate, springs, 1'60 knots.	S. $\frac{1}{2}$ E.	Greatest rate, springs, { flood 1'40 } knots. ebb 1'40 }	S. $\frac{3}{4}$ W.	Greatest rate, springs, { flood 2'60 } knots. ebb 3'00 }	* Turn sharply the L. o and C
4	S.W.		S.W. $\frac{3}{4}$ S.		South.		S. $\frac{3}{4}$ W.		
3	S.W. $\frac{1}{2}$ S.		S.W. $\frac{1}{4}$ S.		S. by W. $\frac{1}{4}$ W.		S. by W.		
2	S.W.		S.W. $\frac{1}{2}$ S.		S.S.W. $\frac{1}{4}$ W.		S.S.W.		
1	S.W. $\frac{1}{2}$ W.		S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		S. by W. $\frac{1}{4}$ W.		

COMPARTMENT XI.

Between the latitude 52° and 53° N. and longitude 3° to 4° E.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
After High Water, Dover.	1 N.E.	Greatest rate, springs, 2'00 knots.	Slack.	Greatest rate, springs, 2'25 knots.	N.E. $\frac{1}{2}$ N.	Greatest rate, springs, $\left\{ \begin{array}{l} \text{flood 1'70} \\ \text{ebb 2'00} \end{array} \right\}$ knots.	N.E. $\frac{1}{2}$ N.	Greatest rate, springs, $\left\{ \begin{array}{l} \text{flood 1'70} \\ \text{ebb 2'00} \end{array} \right\}$ knots.	Stream round south-w.
	2 N.E.		N.E.		N.E.		N.E. $\frac{1}{4}$ N.		
	3 N.E.		N.E.		N.E.		N.E.		
	4 N.E. $\frac{1}{2}$ N.		N.E.		N.E. $\frac{1}{4}$ E.		N.E.		
	5 N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		
	6 N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		
Before High Water, Dover.	5 S.W. $\frac{1}{4}$ S.	Greatest rate, springs, 2'00 knots.	S.W. $\frac{1}{2}$ S.	Greatest rate, springs, 2'25 knots.	S. by E. $\frac{1}{2}$ E.	Greatest rate, springs, $\left\{ \begin{array}{l} \text{flood 1'70} \\ \text{ebb 2'00} \end{array} \right\}$ knots.	S.S.E. $\frac{3}{4}$ E.	Greatest rate, springs, $\left\{ \begin{array}{l} \text{flood 1'70} \\ \text{ebb 2'00} \end{array} \right\}$ knots.	Stream round south-w.
	4 S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		S.S.W.		South.		
	3 S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{2}$ W.		S.W. $\frac{1}{2}$ S.		S.W. $\frac{1}{2}$ S.		
	2 S.W. $\frac{1}{2}$ S.		S.W. $\frac{3}{4}$ W.		S.W. $\frac{1}{2}$ S.		S.W. $\frac{1}{2}$ S.		
	1 S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ W.		S.W. $\frac{1}{2}$ S.		S.W. $\frac{1}{2}$ S.		

COMPARTMENT XII.

Between the latitude 52° and 53° N. and from longitude 4° E. to the Coast of the Netherlands.

Hours.		REMARKS.
After High Water, Dover.	Stream runs northward.	The stream takes the direction of the land, except close to the banks, for which special instructions are necessary.
Before High Water, Dover.	Stream runs southward.	

COMPARTMENT XIII.

Between the latitude 53° and 54° N. and from longitude 1° to 3° E.

Hrs.	S. W. Quarter.	Rate.	S. E. Quarter.	Rate.	N. E. Quarter.	N. W. Quarter.	Leman and Ower Light Vessel.		REMARKS.
							Course.	Rate.	
1	N. N. W. ¼ W.	Greatest rate, springs, { flood 2'25 } ebb 2'25 } knots.	N. by W. ¼ W.	Greatest rate, springs, { flood 2'00 } ebb 2'30 } knots.	N. N. W. ¼ W.	N. ½ W.	N. by W. ¼ W.	Greatest rate, springs, 2'0 knots.	Near the north point of Smith's Knoll the rates are, flood 2'6, ebb 3'0 knots.
2	N. W. ½ N.		N. by W. ¼ W.		North.	N. ¾ W.	N. by W. ¼ W.		
3	N. N. W. ½ W.		N. ¼ E.		N. by E.	N. by W. ½ W.	N. N. W.		
4	N. N. W. ¾ W.		N. ¼ E.		N. N. E.	N. W. ½ W.	N. N. W.		
5	N. N. W. ¾ W.		N. ¼ E.		E. N. E.	S. by W. ¼ W.	N. N. W.		
6	- - -		N. N. E. ¼ E.		S. E.	S. ¼ E.	Slack.		
5	S. S. E. ¼ E.	Greatest rate, springs, - - -	S. S. E. ¼ E.	Greatest rate, springs, - - -	S. E. ½ S.	S. ½ E.	S. S. E.		
4	S. S. E. ½ E.		S. S. E. ¾ E.		S. ¾ E.	S. by E. ¼ E.	S. S. E.		
3	S. S. E. ¾ E.		S. by E.		South.	S. S. E. ¼ E.	S. S. E.		
2	S. by E.		S. ¼ E.		S. ¾ W.	E. S. E. ½ E.	S. S. E.		
1	S. S. E. ½ E.		S. by W.		South.	N. E. by N.	S. S. E.		

COMPARTMENT XIV.

Between the latitude 53° and 54° N. and 3° to 5° E. longitude.

hrs.	S. W. Quarter.	Rate.	S. E. Quarter.	Rate.	N. E. Quarter.	Rate.	N. W. Quarter.	Rate.	REMARKS.
1	W. N. W. $\frac{1}{4}$ W.	Greatest rate, } "rings, } flood 1'20 } ebb 1'50 } knots.	W. S. W. $\frac{1}{2}$ W.	Greatest rate, } flood 1'35 } ebb 2'00 } knots.	W. $\frac{3}{4}$ S.	Greatest rate, } flood 0'80 } ebb 1'00 } knots.	S. W. by W.	In the north-eastern quarter of this compartment the Helgoland stream joins the Channel stream on the falling water at Dover, and the streams split on the rising water at Dover, and a vessel to the northward of 53'30 on the rising tide will be set down towards Helgoland.	
2	N. N. W. $\frac{1}{2}$ W.		W. S. W. $\frac{1}{4}$ W.		West.		N. W. by W. $\frac{1}{2}$ W.		
3	N. by W. $\frac{3}{4}$ W.		W. $\frac{3}{4}$ S.		West.		N. W. $\frac{1}{2}$ N.		
4	N. by E. $\frac{1}{4}$ E.		N. N. W.		N. N. W. $\frac{1}{2}$ W.		N. by W. $\frac{1}{2}$ W.		
5	N. E. $\frac{1}{2}$ N.		N. E. $\frac{1}{4}$ N.		N. E. $\frac{1}{2}$ N.		N. E. by N.		
6	N. N. E. $\frac{1}{4}$ E.		N. E. by E. $\frac{1}{2}$ E.		E. $\frac{3}{4}$ N.		E. by N.		
5	E. $\frac{1}{4}$ S.	Greatest rate, } "rings, } flood - } ebb - } knots.	E. N. E. $\frac{1}{4}$ E.	Greatest rate, } flood - } ebb - } knots.	E. by S.	Greatest rate, } flood - } ebb - } knots.	S. E. by E.		
4	S. E. $\frac{1}{2}$ S.		E. N. E. $\frac{1}{2}$ E.		E. S. E. $\frac{3}{4}$ E.		S. E. $\frac{1}{2}$ E.		
3	S. by E.		S. S. W. $\frac{1}{4}$ W.		S. E. $\frac{3}{4}$ E.		South.		
2	S. by W. $\frac{1}{4}$ W.		S. W. by S.		S. E. $\frac{1}{4}$ S.		S. W. $\frac{3}{4}$ S.		
1	S. W. $\frac{1}{2}$ S.		S. W. $\frac{1}{4}$ S.		S. $\frac{3}{4}$ E.		S. W. $\frac{1}{2}$ S.		

COMPARTMENT XV.

Between the latitude 53° and 54° N. and westward of longitude 1° E.

Hours.	Course.	Rate.	Spurn Light Vessel.		Dudgeon Light Vessel.	
			Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. $\frac{1}{4}$ E.	Greatest rate, } flood 2'50 } knots. ebb 3'75 }	E.N.E.	Greatest rate, springs, 3'25 knots.	N. by W. $\frac{1}{2}$ W.	Greatest rate, springs, 2'5 knots.
	2 N.N.W. $\frac{1}{4}$ W.		S.W. by S.		N.N.W.	
	3 -		S.W. $\frac{1}{2}$ S.		N.W. $\frac{1}{4}$ N.	
	4 S.W.		S.W.		W. $\frac{1}{4}$ S.	
	5 S.W. $\frac{1}{2}$ W.		S.W.		S.W. $\frac{1}{4}$ S.	
	6 S.W. $\frac{1}{4}$ S.		S.W.		S. $\frac{1}{4}$ E.	
	5 S. $\frac{1}{4}$ E.		S.W.		S. by E. $\frac{1}{4}$ E.	
	4 S. by E. $\frac{1}{4}$ E.		N.E. by E.		S.S.E.	
	3 S.S.W. $\frac{1}{4}$ W.		N.E. by E. $\frac{1}{2}$ E.		S.E.	
	2 N. by E. $\frac{1}{4}$ E.		E.N.E.		E. $\frac{1}{2}$ S.	
Before High Water, Dover.	1 N.N.E. $\frac{1}{4}$ E.		E.N.E.		N.E. $\frac{1}{2}$ N.	

COMPARTMENT XVI.

On the parallel of 54° N.

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. by W. $\frac{1}{2}$ W.		N.N.W. $\frac{1}{2}$ W.		N.W. $\frac{1}{4}$ W.		N.W. by W. $\frac{1}{4}$ W.	
	2 N. by W. $\frac{1}{2}$ W.		N.W. $\frac{1}{4}$ N.		N.W. by W. $\frac{1}{4}$ W.		W.N.W. $\frac{1}{4}$ W.	
	3 N.W. by N.		N.W. $\frac{1}{4}$ W.		N.W. by W. $\frac{1}{4}$ W.		W. by N.	
	4 S. $\frac{1}{2}$ E.		W.N.W. $\frac{1}{2}$ W.		N.W. $\frac{1}{4}$ N.		N. $\frac{1}{4}$ W.	
	5 S. $\frac{1}{4}$ E.		W. $\frac{1}{2}$ S.		N. by W.		N.E. $\frac{1}{2}$ N.	
	6 S.S.E.		S. by E.		E. by N.		E. by N.	
	5 S.E. $\frac{1}{2}$ S.		S.E. $\frac{1}{4}$ S.		E.S.E. $\frac{1}{4}$ E.		E. $\frac{1}{4}$ N.	
	4 S.E. by E.		S.E. $\frac{1}{4}$ E.		E.S.E. $\frac{1}{4}$ E.		E. $\frac{1}{2}$ S.	
	3 E. $\frac{1}{4}$ S.		S.E. $\frac{1}{2}$ E.		E.S.E. $\frac{1}{4}$ E.		E. by S.	
	2 N.E. $\frac{1}{4}$ N.		S.E. by E. $\frac{1}{4}$ E.		E.S.E.		S.E.	
Before High Water, Dover.	1 N. by E. $\frac{1}{4}$ E.		E.N.E. $\frac{1}{2}$ E.		S. $\frac{1}{4}$ W.		S. by E. $\frac{1}{2}$ E.	

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.W. by W. $\frac{1}{4}$ W.	Greatest rate, 1 knot.	W. by N.	Greatest rate, 1 knot.	West		E.N.E. $\frac{1}{4}$ E.	Greatest rate, 1 knot.
	2 N.W. by W.		W.N.W.		W.N.W.		N.E. $\frac{1}{2}$ E.	
	3 W.N.W.		W.N.W.		W.N.W.		N.W.	
	4 W.N.W.		W. by N.		W.N.W.		W.N.W.	
	5 W.N.W.		W.N.W.		W.N.W.		N.W. by W.	
	6 W.N.W.		W.N.W.		W.N.W. $\frac{1}{2}$ W.		W. $\frac{1}{2}$ S.	
	5 E.S.E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		S.S.E. $\frac{1}{2}$ E.		W. by S.	
	4 S.E. by E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		S.S.W. $\frac{1}{4}$ W.	
	3 S.E. $\frac{1}{2}$ E.		E.S.E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		S. $\frac{1}{4}$ E.	
	2 S.E. $\frac{1}{4}$ E.		E.S.E. $\frac{1}{4}$ E.		S.E. by E. $\frac{1}{2}$ E.		S.E. by E.	
Before High Water, Dover.	1 S.E. by E. $\frac{1}{2}$ E.		E.S.E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		E.N.E. $\frac{1}{4}$ E.	

About the meridian of 8° E. the influence of the Elbe and Weser causes the stream to run nearly two hours to the north-eastward on the falling tide after it has turned westward in other parts, and on the rising tide to run two hours to the westward after the stream has turned eastward in a more westerly meridian.

COMPARTMENT XVII.

On the parallel of 55° N.

Hours.	0° E.		1° E.		2° E.		3° E.		Hours.
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	
After High Water, Dover.	1 N.N.W.	½	Slack.		N.N.E.		W. ½ S.		Before High Water, Dover.
	2 S. by W. ½ W.	½	S.W. ½ W.		W.S.W.		W. ½ N.		
	3 S. by E.	1 ½	S.S.W. ½ W.		W.S.W. ½ W.		W. ½ N.		
	4 S. ½ E.	1	S. by W. ½ W.		S.W. by W.		N.W. by W.		
	5 S. ½ E.	½	S. by W. ½ W.		S. ½ E.		S.W. by W. ½ W.		
	6 S. ½ E.	½	S. ½ W.		S. by E. ½ E.		S. by E.		
Before High Water, Dover.	5 S.E. ½ S.	½	S. ½ E.		E.S.E. ½ E.		S. ½ E.		After High Water, Dover.
	4 N.N.E. ½ E.	½	E.N.E. ½ E.		E. ½ S.		S.E. by E.		
	3 N. ½ W.	1 ½	N. by E. ½ E.		E. by N.		E. by S.		
	2 N. ½ W.	1	N.N.E.		E. ½ N.		E. by S.		
	1 N. ½ W.	½	N. by E. ½ E.		N.E. by E.		N.E. by N.		

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.W.		W. ½ N.		W.N.W. ½ W.		N. by W. ½ W.	
	2 W.N.W. ½ W.		W.N.W.		W.N.W. ½ W.		N. by W. ½ W.	
	3 W.N.W. ½ W.		N.W. by W. ½ W.		N.W. by W. ½ W.		N.W. ½ N.	
	4 N.W. by W. ½ W.		W.N.W. ½ W.		W.N.W. ½ W.		N.N.W. ½ W.	
	5 W. ½ N.		W.N.W. ½ W.		W. by N.		N.W.	
	6 Turning.		N.W. by W. ½ W.		W. ½ S.		N.W. by W. ½ W.	
Before High Water, Dover.	5 E. ½ S.		S.E. ½ S.		S.W. ½ W.		W. ½ S.	
	4 E.S.E. ½ E.		S.E. by S.		S. ½ E.		S. by W. ½ W.	
	3 E.S.E. ½ E.		S.S.E. ½ E.		S.S.E. ½ E.		S. ½ W.	
	2 E.S.E. ½ E.		S.S.E. ½ E.		S.E. by S.		S. ½ E.	
	1 E. ½ S.		S.S.E. ½ E.		S.E. by S.		S. by E. ½ E.	

COMPARTMENT XVIII.

On the parallel of 56° N.

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.N.E. ½ E.		Slack.		N.W. ½ W.		N. ½ E.	
	2 Slack.		S.W. ½ W.		W.N.W.		N.N.W. ½ W.	
	3 S. ½ W.		S.W. ½ W.		N.W. ½ N.		N.W. ½ W.	
	4 S. ½ E.		W. by S.		N.W.		N.E. ½ E.	
	5 S. ½ E.		S. ½ E.		N. by W. ½ W.		N.E. by E. ½ E.	
	6 S. ½ E.		S. ½ E.		N. ½ W.		E. ½ S.	
Before High Water, Dover.	5 S.E. by E. ½ E.		E. by S.		N. by E. ½ E.		E. ½ N.	
	4 N.E. by E. ½ E.		E.N.E. ½ E.		N.E. ½ E.		E. ½ N.	
	3 N.E. ½ N.		E.N.E.		East.		N.E. by E. ½ E.	
	2 N.E. by N.		N.E. by E. ½ E.		N.E. by E.		E.N.E. ½ E.	
	1 N.E. ½ E.		N.E. by E.		North.		N.E. by E. ½ E.	

COMPARTMENT XVIII.—continued.

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 Turning.	Greatest rate at springs $\frac{3}{4}$ knot about half tide.	Slack.	Greatest rate at springs $\frac{3}{4}$ knot about half tide.	E.N.E. $\frac{1}{4}$ E.	Greatest rate at springs $\frac{3}{4}$ knot about half tide.	N.E. $\frac{3}{4}$ E.	Greatest rate at springs $\frac{3}{4}$ knot about half tide.
	2 W. $\frac{1}{4}$ S.		N.N.W.		N.E. by N.		N. $\frac{1}{2}$ E.	
	3 N.W. $\frac{1}{2}$ N.		N.N.W.		N. $\frac{1}{2}$ E.		N. $\frac{1}{4}$ W.	
	4 N. by W. $\frac{3}{4}$ W.		N. by W. $\frac{3}{4}$ W.		N. $\frac{1}{4}$ W.		N. by W.	
	5 N.N.E. $\frac{3}{4}$ E.		N. $\frac{1}{4}$ W.		N. $\frac{1}{2}$ W.		N. by W.	
	6 N.E. $\frac{3}{4}$ E.		N.N. E.		N. by W.		N. by W.	
Before High Water, Dover.	5 E.N.E. $\frac{3}{4}$ E.	Greatest rate at springs $\frac{3}{4}$ knot about half tide.	N.E. by E. $\frac{1}{4}$ E.	Greatest rate at springs $\frac{3}{4}$ knot about half tide.	N. by W.	Greatest rate at springs $\frac{3}{4}$ knot about half tide.	N.N. W. $\frac{1}{4}$ W.	Greatest rate at springs $\frac{3}{4}$ knot about half tide.
	4 N.E. by E. $\frac{3}{4}$ E.		E.N.E. $\frac{1}{4}$ E.		N.E. $\frac{3}{4}$ E.		N. by E.	
	3 E.N.E. $\frac{3}{4}$ E.		E. $\frac{1}{4}$ N.		E. $\frac{3}{4}$ S.		S. by W.	
	2 East.		E. $\frac{3}{4}$ S.		E. $\frac{3}{4}$ S.		S.W.S.	
	1 E. $\frac{1}{4}$ N.		E. by S.		S.E. $\frac{3}{4}$ E.		S.W. $\frac{3}{4}$ W.	

COMPARTMENT XIX.

On the parallel of 57° N.

Hours.	2° W.		1° W.		0	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S. W. by S.	Greatest rate $1\frac{1}{2}$ knots at half tide.	S. by W. $\frac{3}{4}$ W.	Greatest rate $1\frac{1}{2}$ knots at half tide.	S. by W. $\frac{3}{4}$ W.	Greatest rate $\frac{3}{4}$ knot about half tide.
	2 S. W. by S.		S.W. $\frac{1}{4}$ S.		S.S.W.	
	3 S. W. $\frac{1}{4}$ W.		S.W.		S. by W.	
	4 N. $\frac{1}{4}$ W.		W.S.W. $\frac{1}{4}$ W.		S. by W.	
	5 Slack.		Slack.		S. $\frac{1}{4}$ E.	
	6 N.N.E. $\frac{1}{4}$ E.		N. by E. $\frac{1}{4}$ E.		Slack.	
Before High Water, Dover.	5 N.E. $\frac{3}{4}$ N.	Greatest rate $1\frac{1}{2}$ knots at half tide.	N.N.E.	Greatest rate $1\frac{1}{2}$ knots at half tide.	N.N.E. $\frac{3}{4}$ E.	Greatest rate $\frac{3}{4}$ knot about half tide.
	4 N.E.		N.N.E.		N. by E.	
	3 N.E. by N.		N.N.E. $\frac{1}{4}$ E.		N. by E. $\frac{3}{4}$ E.	
	2 N.E. by N.		N.E. $\frac{1}{4}$ N.		N.N.E. $\frac{1}{4}$ E.	
	1 South.		E.N.E.		N. by E. $\frac{3}{4}$ E.	

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	R. c. R.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.S.W. $\frac{3}{4}$ W.	Greatest rate $\frac{3}{4}$ knot about half tide.	N. by E. $\frac{3}{4}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	S.S.E. $\frac{1}{4}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	S.W. $\frac{1}{4}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.
	2 S.W. $\frac{3}{4}$ S.		S. $\frac{3}{4}$ E.		South.		N.W. by W. $\frac{1}{4}$ W.	
	3 S.S.W. $\frac{3}{4}$ W.		S. by E.		S. by W. $\frac{1}{4}$ W.		W.N.W.	
	4 S.W. $\frac{1}{4}$ S.		S.E. by S.		S.W. by W. $\frac{1}{4}$ W.		N. by W. $\frac{1}{4}$ W.	
	5 Slack.		E. by S.		Slack.		N. by W.	
	6 N.E. $\frac{1}{4}$ E.		E. $\frac{3}{4}$ N.		Slack.		N. by E.	
Before High Water, Dover.	5 N.E. $\frac{1}{4}$ E.	Greatest rate $\frac{3}{4}$ knot about half tide.	E. $\frac{1}{4}$ N.	Greatest rate $\frac{1}{2}$ knot about half tide.	Turning.	Greatest rate $\frac{1}{2}$ knot about half tide.	N.N.E. $\frac{1}{4}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.
	4 N. E. by E.		E. by N.		N.E. by N.		N.E. $\frac{3}{4}$ N.	
	3 E.N.E. $\frac{1}{4}$ E.		East.		N.E. $\frac{3}{4}$ E.		N.E. by E. $\frac{1}{4}$ E.	
	2 E.N.E. $\frac{1}{4}$ E.		East.		E. by N.		E.N.E.	
	1 Slack.		S. $\frac{3}{4}$ E.		S.E. by E. $\frac{3}{4}$ E.		E. $\frac{1}{4}$ S.	

COMPARTMENT XIX.—continued.

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. by E. ¼ E.	Greatest rate 1½ knot about half tide.	S. by E.	Greatest rate ¾ knot about half tide.	E.N.E.	Greatest rate ¾ knot about half tide.	S.S.E.	Rate 0·9 knot.
	2 N.E. by N.		South.		E.N.E. ¼ E.		Slack.	
	3 S.W.		S. by W.		E.N.E.		N.E. by N.	
	4 N.N.W.		N.N.E.		E.N.E.		N.E. ¾ N.	
	5 N. ¾ W.		North.		E.N.E.		North.	
	6 N. by E. ¼ E.		North.		N.N.E.		N. by E.	
Before High Water, Dover.	5 N.E.	Greatest rate 1½ knot about half tide.	N. by E.	Greatest rate ¾ knot about half tide.	N.E. ¾ E.	Greatest rate ¾ knot about half tide.	N.E. ¼ E.	
	4 N.E.		N.N.E. ¼ E.		N.E. by N.		N.N.E. ¾ E.	
	3 N.E. ¼ E.		N.E. ¼ E.		N.E.		N.E. by E. ¼ E.	
	2 E. ¾ N.		E. by N.		N.E.		N.E. by E. ¾ E.	
	1 East.		E. by N.		N.E.		E.N.E. ¼ E.	

COMPARTMENT XX.
On the parallel of 58° N.

Hours.	3° W.		2° W.		1° W.		°	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 South.	Greatest rate 1 knot about half tide.	S.E.	Greatest rate 0·6 knot about half tide.	S.S.W.	Greatest rate 1 knot about half tide.		
	2 S.E. ¾ S.		S.E.		S.S.W.			
	3 East.		S. ¼ E.		S.S.W.			
	4 E. by S.		S.E. ¾ S.		Slack.			
	5 Slack.		Slack.		N.N.W. ¾ W.			
	6 S.W.		N. by W.		N.N.E.			
Before High Water, Dover.	5 W. ¾ N.	Greatest rate 1½ knot about half tide.	N.W. ¾ W.	Greatest rate ¾ knot about half tide.	N.N.E. ¾ E.	Greatest rate ¾ knot about half tide.		
	4 W.N.W. ¼ W.		N.W.		N.E.			
	3 N.W. by W. ½ W.		N.W. by N.		N.E. ¾ E.			
	2 W. by N.		W. ¼ N.		S.S.E. ¼ E.			
	1 W. ¾ N.		S. ¾ E.		S.S.E. ¾ E.			

Hours.	1° E.		2° E.		3° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.W.	Greatest rate ¾ knot about half tide.	S.W.	Greatest rate ¾ knot about half tide.	S. by E.	
	2 West.		W.S.W.		S. ¼ E.	
	3 Slack.		W.N.W. ¼ W.		S. ¼ W.	
	4 Slack.		N.W. ½ N.		S.S.W.	
	5 N.N.E.		N. ¼ E.		S. ¾ W.	
	6 N.N.E.		N. by E.		E. by N.	
Before High Water, Dover.	5 N.N.E.	Greatest rate ¾ knot about half tide.	N. by E.	Greatest rate ¾ knot about half tide.	E.N.E.	
	4 N.N.E.		N. by E. ¼ E.		E.N.E.	
	3 N. by E. ¾ E.		N. by E.		E. by N.	
	2 Turning.		N.E. ¼ E.		E.S.E. ¼ E.	
	1 W. by N. ¼ N.		S.E.		S.E. by E.	

TIDAL STREAMS.

COMPARTMENT XXI.

On the parallel of 59° N.

Hours.	2° W.		1°		0	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.W. by S.	Greatest rate 1 knot about half tide.	S.S.W. ½ W.	Greatest rate 0·6 knot about half tide.	W.S.W.	Greatest rate ¾ knot about half tide.
	2 S. by W. ¾ W.		S.W. by S.		W.S.W. ¾ W.	
	3 S. ¾ W.		S.W. by S.		N. by E. ½ E.	
	4 S.W. by W. ½ W.		Slack.		N.E.	
	5 W. by N.		Slack.		N.E. ¼ E.	
	6 N.W. ½ W.		N. ¾ E.		N.E. by E.	
Before High Water, Dover.	5 N.N.W. ¾ W.	Greatest rate 1 knot about half tide.	N.N.W.	Greatest rate 0·6 knot about half tide.	N.E. by E.	Greatest rate ¾ knot about half tide.
	4 N.W. ½ N.		N.N.W.		E. by N.	
	3 W.N.W.		N.W. by N.		S.E. ¼ E.	
	2 S.W. by W. ½ W.		S.W. by W. ¼ W.		S.S.W. ½ W.	
	1 S.W. ¼ W.		S.W. ¾ S.		W.S.W.	

All the foregoing bearings are magnetic.

TIME
OF
HIGH WATER ON FULL AND CHANGE DAYS;
WITH THE RISE OF THE TIDE
AT SPRINGS AND NEAPS.

AUTHORITIES.

Admiralty Charts. Alldridge, Barnett, Bate, Bayfield, Beaufort, Becher, Bedford, Beechey, Belcher, Biddlecombe, Blackwood, Boteler, Bullock, Burdwood, Calver, Church, Collinson, Cox, Dayman, Denham, Drury, Edye, Evans, Fitz-Roy, Flinders, Frazer, Hewett, Hoskyn, Kellett, King, Lawrance, Lord, Mackenzie, Mooney, M'Dougall, Mudge, Orlebar, Otter, Owen, Parry, Raper, Richards, Robinson, Roe, Ross, Sheringham, Shortland, Skead, Slater, Spence, Stanley, Stanton, Stokes, Sullivan, Thomas, Vidal, Ward, Washington, White, Wickham, Williams, Wolfe, Wood, and Yule, of the Royal Navy; and Blair, Constable, Haines, Horsburgh, Moresby, Robinson, Ross, Stiffe, Wales, and Ward, of the Indian Navy. Maclear, H.M. Astronomer at the Cape of Good Hope.

Pilote Français. Beautemps-Beaupré, Bégat, Bougainville, Chazallon, D'Entrecasteaux, Urville, Duperrey, Givry, La Pérouse, and Roussin of the French Navy.

Bellingshansen, Krusenstern, Lisiansky, and Lütke of the Russian Navy.

Gasman, Melville, Smits, Swart, and Van Rhyn of the Dutch Navy.

Lint, Löwenorn, and Zahrtmann of the Danish and Swedish Navies.

laun, Malaspina, and Tofiño of the Spanish Navy.

S. Coast Survey under Professor A. D. Bache. Maury and Wilkes of the U. S. Navy

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As it is desirable that the following list should be made accurate and complete, it is requested that corrections and additions be forwarded to the Secretary of the Admiralty.

TIME

OF

HIGH WATER ON FULL AND CHANGE DAYS

AT THE PRINCIPAL PLACES ON THE GLOBE;

ARRANGED ACCORDING TO THE APPARENT PROGRESS OF THE TIDE WAVE,

*With the Rise of the Tide at Springs and Neaps.**

query, thus ?, is placed after the Time of High Water and the Rise, it indicates that what are given are approximations.)

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>England, South Coast.</i>							
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Is. (St. Agnes)	4 30	16	12	Chesilton -	6 13	10½	7
Is. (St. Mary)	4 27	16	12	Portland Breakwater	7 1	6½	4½
Is. (St. Agnes)	4 30	16	12½	Poole - -	9 10	6½	4½
Is. (St. Mary)	5 0	14½	10½	Christchurch -	12 45	5	
Is. (St. Agnes)	4 35	14½	11½	Needles Point -	9 0	7½	5
Is. (St. Mary)	4 57	16	12	Hurst, Camber -	11 30	7½	6
Is. (St. Agnes)	5 5	10	6	Yarmouth - -	9 46	12½	9½
Is. (St. Mary)	5 4	15½	12	West Cowes -	10 0	13	9½
Is. (St. Agnes)	5 14	15	11½	Calshot -	12 0	13	9½
Is. (St. Mary)	5 26	16	13	(Castle Point) }	10 30	13	9½
Is. (St. Agnes)	5 37	15½	11½	Southampton -	12 45	12½	10
Is. (St. Mary)	5 32	15½	11½	Portsmouth Dk. Yard	11 41	13½	10½
Is. (St. Agnes)	5 43	15½	11½	Portchester (off the	11 46	6½†	4†
Is. (St. Mary)	5 45	15	11	Castle) -	11 48	11½	8½
Is. (St. Agnes)	5 47	14½	10½	Portsmouth bridge (a ½ mile	11 51	7½	4½
Is. (St. Mary)	5 55	13½	9½	W. of bridge) -	11 0	14	10½
Is. (St. Agnes)	6 6	12½	8½	Fareham (in Chan-	11 30	16½	12½
Is. (St. Mary)	6 12	10½	6½	nel close to the	11 45	16½	12½
Is. (St. Agnes)	6 17	5½	1½	Upper Quay) -	11 36	16	11½
Is. (St. Mary)	5 47	14½	10½	Arundel (Bar) -	11 35		
Is. (St. Agnes)	5 47	8½	4½				
Is. (St. Mary)	5 37	16½	11½				
Is. (St. Agnes)	5 40	16½	11½				
Is. (St. Mary)	5 47	16½	11½				
Is. (St. Agnes)	5 45	15½	11½				
Is. (St. Mary)	5 41	15	11½				
Is. (St. Agnes)	6 16	14	10				
Is. (St. Mary)	6 0	13	9½				
Is. (St. Agnes)	6 0	13½	10				
Is. (St. Mary)	6 21	12½	8½				
Is. (St. Agnes)	6 21	11½	8½				
Is. (St. Mary)	6 5	11½	7½				

The Rise of the tide is meant its vertical rise above the mean low water level of spring-tides. See

Diagram, page vi.

† Above the bed of the lake.

Loc.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
(Town) -	12 25			Cardigan -	7 1	12	
" -	11 34	18	13½	New Quay -	7 30	11	
" -	11 15	19½	16	Aberystwyth -	7 31	13½	1
" -	11 51	20	15	Aberdovey -	8 0	15	
Lead -	11 20	20	15	Sarn-y-bwch Reef -	7 40	14	
" -	10 53	24	17½	Barmouth -	7 41	17	1
" -	11 20	22	17½	Sarn Badrig -	7 30	13	
" -	10 45	21½	19	Port Madoc -	7 30	17	
" -	11 7	20	16½	St. Tudwall Road -	7 45	14	
" -	11 12	18½	15	Pwllheli -	7 46	13½	
" -	11 15	16	12½	Bardsey Id. -	7 40	15	
" -	11 44	15	12	Porth-dyn-lleyn -	8 30	16	
<i>England and Wales, West Coast.</i>				Caernarvon -	9 33	13½	
es -	4 30	16	12	Holyhead -	10 11	16	
ines) -				Amlwch -	10 30	18½	
es -	4 27	16	12	Beaumaris -	10 32	21½	
ry) -				Chester -	10 30	26	
nwall -	4 35	18½	13½	Liverpool -	11 23	26	
" -	4 44	21	15	Formby Point -	10 35	28	
" -	5 13	20½	16½	Ribble Lighthouse -	10 51	24	
" -	5 15	25	17½	Preston -	11 49	10	
m -	5 45	23	17	Fleetwood (Wyre Lt) -	11 11	27	
land -	5 15	27	20	" (Port) -	11 12	26½	
e (Bar) -	5 30	19	14	Lancaster -	11 16	8½	
e (Bridge) -	6 28	10½	7½	Poulton-le-Sands -	11 26	27½	
" -	5 58	23	16½	Piel Harbour (Pier) -	11 5	28	
" -	6 7	16	12	Whitehaven -	11 14	23½	
" -	5 42	27½	21½	Port Harrington -	11 5	26	
" -	6 30	22	26½	Workington -	11 4	20	
ter Bar -	6 50	35	26½	Maryport -	11 3	18	
pper-mare -	6 54	37	28½	Abbey Head -	11 10	23	
Islands -	6 54	37½	28½	Southernness -	11 20	28	
d -	7 16	41½	31	Annan Foot -	11 56	30	
ing Road) -	6 56	44	33	Port Carlisle -	12 10	20	
" -	7 30	38	28½	Point of Ayr -	11 7	20½	
" -	7 10	24	18	Douglas, I. of Man -	11 12	20½	
" -	6 59	22	29	Ramsey -	11 12	19½	
nt -	6 25	22	25	Peel -	11 8	16½	
(Mem- -				Calf Sound -	11 17	16½	
hthouse) -	6 1	27½	20½	Port St. Mary -	11 10	20	
wl -	6 8	28½	21½	Castletown -	11 10	20	
(Bar) -	6 16	28	21	<i>Scotland, West Coast.</i>			
ben (Bar) -	6 10	26	19½	Kirkcudbright -	11 10	23	
and -	6 0	24½	16½	Solway (Tarn Point) -	11 22	23	1
" -	6 0	21	20	Troon -	11 50	10	
St. Ann -	5 56	24	18	Mull of Galloway -	11 15	15½	1
ouse) -				Port Patrick -	11 10	15	1
Dk. Yard -	6 12	21	15½	Loch Ryan -	11 12	11	
Castle, -	6 23	20	14½	Mull of Cantyre -	10 35	4	
ddan R. -	6 27	20	14½	Campbellton -	11 45	8½	
ping -	6 31	19	13½	Lamlash -	11 49	10	
Milford -	6 42	7½	2½	Ayr -	11 50	9½	
dwest -	6 42	7½	2½	Ardrossan -	11 45	10	
Light -	6 0	21		Millport, Great -	11 50	10	
" -	6 0	17		Cumbræ -	11 50	10	
ound -	6 0	17		Largs -	11 50	10	
1 -	6 56	11½	6½	Inverary -	12 0	10	
" -	7 0	12	9	Greenock -	0 8	9½	
				Port Glasgow -	0 18	9	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
rtom -	0 20	9		Vallay, North Uist	6 10	11½	8½
(Canal	0 39	9		Barra, North Harb.	5 48	11½	
nce) -	1 15	9		Loch Maddy, } North Uist }	6 6	12½	9½
-	1 25	9	7½	Loch Eport "	6 6	12½	9½
ng -	12 6	12		Berneray, I. of Harris	6 11	13	9½
oil -	12 6	10	6	West Loch Tarbert "	6 4	11½	8½
nvan -	11 55	6		East Loch Tarbert	6 10	13½	III
les, Kyles }	11 50	10	8	Obb of Harris -	6 16	11½	8½
e -	11 49	10		Loch Seaforth }	6 16	15	10
Head -	11 50	9	6	(Athline) -			
ig, Loch }	11 53	9	7½	Loch Roag (Ber-	6 11	11	8
-				nera) Lewis I. }			
und -	2 22	4	2½	Loch Erisort,	6 43	15½	11½
m, Islay -	5 0	5	4	Lewis Id. -			
caig " -	4 58	6½	4	Loch Clay " -	6 9	14½	9½
olin Ferry	4 41	6½	4½	Stornoway " -	6 46	13½	9½
Side -	4 56	3½	2½	St. Kilda -	5 30		
-	4 49	6-8	4-5	Rockall -	3 30	12	
land -	5 2	11½	7	Cape Wrath -	7 30	15½	
Sound -	5 10	10-12		Loch Tongue -	7 53	15	12
-	5 22	12	9½	Loch Eriboll -	7 43	14½	11
-				Thurso -	8 28	14½	11
pin -	5 26	12½	8½	Stroma, S. side -	9 47	9	6½
-	5 15	13	9	Swona, E. side -	10 24	10	7½
of Mull -	5 0	12	10	" W. side -	9 35	10	7
ine -	5 33	13½	10½	Great Skerry, }	11 4	9½	6
ry " -	5 36	■	9½	E. side -			
sea -	6 0	■	11	" W. side -	10 53		
adh (Go- }	5 29	11½	8	<i>Orkneys.</i>			
I. of Mull }				Stromness -	9 0	III	7½
and -	5 11	11½	8½	Westness -	9 11	III	7½
n -	5 24	12	8½	Kirkwall -	10 9	10	7½
-	5 28	10	7½	Deer Sound -	10 30	10	7½
edart -	5 44	13½	9½	Widewall -	9 3	10	7½
earn -	5 45	13½	10½	Otterswick -	9 13	11	8
-	5 50	13½	10	<i>Shetland Isles.</i>			
Carron }	6 29	16½	11½	Balta -	9 45	6	4½
skton) -				Lerwick -	10 30	6	4
wich -	6 0	15½	11	Hillswick, or Urie }	9 45	6½	6
erridon -	6 20	15	11	Firth -			
ona, I. of Hae.	6 30	14½	10½	Scalloway -	9 30	5½	4½
levia -	5 47	14½	10	Sumburgh Head -	9 45		
Dunvegan }				Fair Isle -	11 0	5	3½
nvegan }	6 7	15½	11	<i>Scotland, East Coast.</i>			
ls, I. of }				Duncansby Ness -	10 14	10	7
s) -				Wick -	11 22	10	7½
r, I. of Skye	5 50	14½	10½	Dornock Road -	11 47	11	
-	6 32	15	10½	Cromarty -	11 56	III	11
Laxford -	6 44	15	11½	Inverness (Kelloch }	12 18	12	9½
ver -	6 41	14	11	Pier) -			
Alah (Kyle }	6 16	15½	11	Banff -	0 28	10½	8
1) -				Fraserburgh -	0 40	11	8½
Summer I.	6 37	14	10½				
Broom }	6 40	14½	10½				
spool) -							
ve (Poolewe)	6 39	14½	10½				
Islands }	5 44	12½	8½				
lay) -							

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Peterhead -	0 34	10½	8½	Wisbeach Eye -		20	
Aberdeen -	1 0	12	10	Sutton Bridge -		18	
Stonehaven -	1 10	14	11	Wisbeach -	7 30	15	
Montrose -	1 25	13	10	Wells Bar -	6 20	12	
Arbroath -	1 35	14	11	Wells -	7 0	12	
Tay River (Bar) -	2 6	16	14	Blakeney Bar -	6 30	15	
Broughty Ferry -	2 22	14½	11	Blakeney -		9	
Dundee -	2 32	14½	11½	Cley -		5½	
Perth -	3 35			Cromer -	7 0	14½	11
Cockenzie, Firth of } Forth - }	2 16	15½	10	Leman Shoal -	6 0		
Leith -	2 17	16½	12½	Ower Shoal -	6 30		
Granton Pier -	2 20	16	12½	Hammond Knoll -	7 40		
Burntisland -	2 24	16½	12½	Winterton Ridge -	7 50		
Queensferry -	2 37	18	14	Yarmouth Road -	9 15	6	4
Kincaidine -	2 53	17½	15	" Haven, Brush		5½	4½
Alloa -	3 18	17½	15	" Bridge -		5	4
Stirling -	3 52	7½	4½	Lowestoft -	9 57	6½	5½
Dunbar -	2 8	14½	11	Blyth River, South } wold }	10 20	6½	4
Eyemouth -	2 15	15½	11½	Aldborough -	10 45	8½	6½
Barwick -	2 18	15	11½	Kentish Knock -	11 47		
<i>England, East Coast.</i>				Orfordness -	11 15	8	6
Holy Island Harb.	2 30	15	11½	Hollesley -	11 30	8½	6½
North Sunderland	2 30	15	11½	Orford Haven Bar	11 30	7½	
Coquet Road -	3 0	14½	11	Orford Quay -	12 36	7½	
Blyth -	3 15	15	11	" Slaughden -	1 0	7½	
Tyne River (Bar)	3 20	14½	11	" Snape Bridge	3 0	6	
" North Shields } (Low Lt. Hse.) }	3 23	13½	10	Woodbridge Haven } Bar }	11 45	12	9
" Howden -		12		" Kingston Quay	12 35	10	
" Walker -		10½		" Wilford Bridge	12 55	7	
" Newcastle -	4 23	10½		Harwich Harbour	12 6	11½	9
Sunderland -	3 22	14½	11	The Naze -	12 6	12½	10
Seaham -	3 24	14½	10½	Orwell River, Pin-	12 20	12	
Hartlepool -	3 28	15	11½	mill -			
Tees River, Bar -	3 45	15		" Downham	12 27	12	
" Middlesborough	3 55	13		" Reach -			
" Stockton -	4 40	11		" River,	12 35	13½	
Whitby -	3 45	15	11½	Ipawich -			
Scarborough -	4 11	15½	12½	Stour River,	12 29	12	
Filey Bay -	4 20	16	12½	Wrabness -			
Flamborough Head	4 30	16	12	" Mistle Quay	12 48	11½	
Bridlington -	4 39	10	12	" Cattawade	1 8	4½	
Humber River, } Spurn Point }	5 26	18½	15	Bridge -			
" Grimsby -	5 36	19½	15	Colne River, Colne } Point }	12 0	14	10
" Killingholme	6 2	19½	15½	" Wivenhoe -	12 10	15	10
" Hull -	6 29	20½	16½	Blackwater River, } Scales Point }	12 0	14½	10
Humber Ouse } River, Goole }	7 44	14		" Heybridge -	12 20	12	8
Boston Deep, Clay } Hole }		21½		Chelmer River, } Maldon }	12 32	10	4
" Hob Hole -		17		Gunfleet Sand, N.E. } end }	11 40	12	8
" (Sluice) -	7 0	12		Crouch River, } Foulness }	12 5	14½	10
Lynn Deep, Long } Sand }	6 0	23		" Hull Bridge	12 25	16	11
" Lynn Road -		20		Maplin Light -	12 5	14½	10
" Lynn -		10		Margate -	11 40	15½	12
				Pansand Hole -	12 0	15½	11

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
	12 30	15½	13	<i>Ireland, West Coast.</i>			
	0 37	16	13½	Cape Clear -	4 0	9	6½
	1 2	17½	14	Skull -	4 2	9½	7½
	1 10	17½	14	Crookhaven -	4 9	9½	8
	1 37	18½	15½	Dunmanus Harbour	3 57	9½	7½
	1 43	19	15	Dunbeacon -	3 51	10½	7½
	1 57	19½	17	Black Ball Harbour	3 40	9½	7½
	2 7	19½	16½	Castletown, Bear- haven -	4 14	9½	7½
<i>Ireland, South and East Coasts.</i>				Bantry Harbour -	3 47	10	7½
Clear -	4 0	9	6½	Bray Head -	10 45	12	9½
More -	4 23	10½	8½	Kenmare R., Bal- lycrovane -	3 42	10½	7½
townsend -	4 21	10½	8	„ Dunkerron	3 45	10½	8
Killy Bay -	4 30	11	8½	„ Ormond -	3 43	10	7½
Macaherry -	4 36	10½	8½	„ West Cove	3 52	10	7½
le -	4 43	11½	9	Ballinskellig Bay -	3 40	11	7½
stown -	5 1	11½	9	Valentia Harbour -	3 42	11	7½
(Penrose) y -	4 58	12½	10	Ventry -	3 44	10½	7½
ottin -	4 54	12	9½	Blasket Islands -	3 30	11½	8
al -	5 14	12½	10	Dingle -	3 51	10½	7½
ecourty, -	5 12	12½	9½	Smervick -	3 50	11½	8
garvan -	5 12	12½	9½	Tralee Bay (Fenit)	4 3	12½	9½
ore -	5 27	12½	9½	R. Shannon, Kil- baha -	4 16	13	9½
ford (Dun- don Fort) -	5 20	12½	10	„ Kilrush -	4 42	14	10½
-(Bridge) -	6 6	13½	10½	„ Carriga- holt -	4 44	14	10½
ross -	6 4	13½	10	„ Tarbert -	4 57	14½	10½
s -	5 40	5	3½	„ Foynes Id.	5 35	15½	12
rd -	7 21	4½	3	„ Mellon -	6 1	16½	13½
chael Point -	8 30	■	■	„ Limerick	6 16	16½	13½
w -	8 45	■	■	Liscannor Bay -	4 23	13½	10
low -	10 29	■	6½	Mutton Island -	4 20	13½	9½
y Island -	10 45	13	11	Galway -	4 35	14½	11
town -	11 10	11	8½	Killeany, Arran Ida.	4 28	13½	10
Bar (Pool- Lt. House) -	11 12	12-14	9-11	Cashla Bay -	4 33	16	■
b Harbour -	11 9	13	10	Kilkieran Cove -	4 34	15½	11
ide Inlet -	11 15	10	8	Greatman Bay -	4 39	16½	11½
stown Inlet -	11 15	10½	■	Roundstone -	4 28	13½	10½
ies Islands -	11 0	■	10	Slyne Head -	4 30	13½	10
iggan -	10 40	11	9	Clifden Bay -	4 30	13½	10
beda (Bar) -	11 0	11½	9	Ballynakill Bay -	4 40	12½	9½
alk -	10 56	13½	11½	Inishbofin -	4 34	12½	9½
castle Point	11 2	14	11½	Inishturk -	4 36	12½	9½
gford (Bar) or	11 0	14	11	Clare Island -	4 38	12½	9½
nfield Point.				Westport -	4 57	12½	9½
Varrenpoint -	11 10	14½	12	Achillbeg -	5 14	10½	8
astle -	10 30	16	12	Bulla Mouth, (N. entrance of Achill Sound) -	5 38	10½	7½
am -	11 0	■	12	Blacksod Bay (Quay) -	4 47	10	8½
Rock -	10 58	13	10½	Broadhaven Harb.	5 0	10½	7½
Strangford Hard Point) -	10 53	14	11½	Killala Bay -	5 22	10½	8
Strangford Quay -	12 31	10½	8½	Sligo Bay -	5 18	11½	8½
Quoile Quay	12 45	11	9½	Ballysadare (Quay)	6 0	8½	5½
Kircubbin	12 42	11½	9½	Sligo Harbour (Oyster Island) -	5 23	11½	8½
Killyleagh	12 40	11	9½				
of the Lough rily Rocks) -	12 44	11½	9½				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>t.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	
Ballyshannon (Bar)	5 18	11½	8½	Granville	6 13	37	3
Donegal Harbour	5 18	11½	8½	Régneville	6 20	■	2
(Salthill Quay)	5 18	11½	8½	St. Germain	6 20	34	2
Teelin Harbour	5 16	11½	8½	Carteret	6 25	■	■
Killybegs	5 16	11½	8½	Ecrehous	6 32	31	2
Lough Rossmore	5 20	11	8	Jersey, Rosel	6 15	30	2
Rutland Island	5 22	11	8	" St. Helier	6 25	30½	2
Gweedore (Banbeg)	5 32	11	8	Diélette	6 40	27	2
				Gouvy	7 6	22	1
<i>Ireland, North and East Coasts.</i>				Omonville	7 29	15½	1
Ballyness (Bar)	5 22	11½	8½	Guernsey (St.)	6 37	26	1
Sheephaven	5 32	11½	8½	Peter Port)	6 37	26	1
Mulroy Bay, (Bar)	5 40	11½	8½	Casquets	6 45	15½	1
" Fanny Hole	6 17	9½	8	Alderney	6 46	17½	1
" Seamount Bay	6 44	7½	8	Cherbourg	7 49	17	1
" Cranford Bay	8 3	4	2½	Barfleur	8 51	17	1
Rathmullan, Lough	5 42	12½	9	La Hougue	8 42	18½	1
Swilly	5 42	12½	9	St. Marcouf Is.	9 55	20	1
Trawbreaga Lough	6 10	11½	8½	Port-en-Bessin	8 57	20	1
Slievebane Bay	5 49	10½	7½	Courseulles	9 7	20	1
Culdaff Bay	5 53	8½	6	Oystreham	9 38	21	1
Warrenpoint,	6 20	6½	5	Merville	9 36	21	1
Lough Foyle	6 20	6½	5	Dives	9 39	21	1
Moville	7 6	7½	5½	Honfleur	9 29	23½	1
Londonderry	8 1	7½	5½	Quillebœuf	10 6	24	1
Coleraine	6 24	6½	4	Caen	10 57	22	1
Port Rush	6 8	5½	3½	Hàvre	9 51	22	1
Skerries	6 15	5	3	Rouen	2 28		
Ballycastle Bay	6 25	3	2	Fécamp	10 44	23½	1
Red Bay (Pier)	10 31	4	4	St. Valéry-en-Caux	10 46	27	2
Cairnlough	10 51	5½	5	Dieppe	11 6	27	2
Maiden Rocks	10 43	6½	6½	Tréport	11 9	27	2
Lough Larne	10 48	6½	6½	Cayeux	11 5	27½	2
Belfast	10 43	9½	8	Houardel	11 26	27½	2
Donaghadee	11 13	11½	9½	St. Valéry-sur-	11 46	27	2
South Rock	10 58	13	10½	Somme.			
Lough Strangford	10 53	14	11½	Boulogne	11 25	25	1
(Killard Point)	10 53	14	11½	Cape Grisnez	11 27	21½	1
				Calais	11 49	19½	1
<i>France, North Coast.</i>				Gravelines	12 0	■	1
Ushant	3 32	19½	13½	Dunkerque	12 8	16½	1
Abervrach	4 14	22	■				
Ile de Bas	4 49	23	17	<i>North Sea, East Coast.</i>			
Roscoff	4 46	23	17½	Nieuport	12 18	16	1
Morlaix Road	4 53	24	18	Ostend	12 25	19	1
Ploumanach	5 15	24½	18½	Blankenberg	12 48	■	1
Ploughrescan	5 17	25½	18½	Bathz	3 15	15	
Tréguier	5 32	25	18½	Flushing	1 20	13	
Héaux Lights	5 45	31	23½	Antwerp	4 25	15	
Bréhat	5 51	31	23½	Veere	1 20	15	
Paimpol	6 0	31	23½	De Roompot	12 30	13	
Portrieux	6 0	31	23½	Zieriksee	2 0	11	
Binnic	6 3	30	22½	Brouwershaven	2 15	10	
Dahouet	6 5	■	23½	Goeree (West Gat)	1 45	7	
Erqui	5 59	33½	■	Hellevoetsluis	2 30	8	
St. Malo	6 5	35	26	Brielle	3 0	■	
Les Minquiers	6 6	35	26	Rotterdam	3 45	7	
Cancale	6 20	37	27	Katwyk	2 30	5	
Iles de Chansey	6 9	35	26	Texel (outside shoals)	6 30	4	
				Kykduin	7 0	12	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.				
ediep -	7 27	4	3½	<i>Iceland.</i>			
elling(West) -	8 40	6	5		h. m.	ft.	ft.
nd Gat -	9 0	7		Reikiavik - -	5 0	17½	13½
Hollum Rd. -	11 30	7		<i>Lapland.</i>			
outer buoy) -	10 0	8-10		Liza Bay - -	5 58	9	
m (road) -	10 30	8-10		Nova Zembla Harb. -	6 36	10	
yl -	11 15	8-10		Jekatarina Islands -	6 23	10	
a -	12 0			Kildin Island -	6 45	12	
rney -	10 30	8		Habitable Island, } -	7 9	9	
; outer light } -	11 30			Seleney Bay - }			
ger Oog -	12 0	9?		Teriberka River -	7 20	12	
land -	11 33	9½	7	Olenji Islands -	7 30	12	
entrance -	12 0	11		Charlowka River -	8 8	12	
Cuxhaven -	1 8	10		Seven Islands -	8 20	12	
Brunsbüttel -	1 58	9		Jukan Islands -	9 0	13	
Gluckstadt -	3 9	10		Sviatoi Nos -	9 15	14	
Altona -	5 19	7		<i>White Sea.</i>			
Hamburg -	5 29	6½		Turna Bay -	9 54	11	
Tonning -	2 1	9		Trek Island -	10 48	20	
Friederich- } -	2 37	9		Litke Ridge -	11 45	15	
stadt - }				Cape Kanushin -	11 54	15	
Rendsborg -	7 42	4		Sosnovets -	11 44	18	
m -	2 36	9		Morjovets I. -	11 20	17	
-	2 21	6		Cape Voronov -	11 20	17	
ng -	2 45	5		Intsi Point -	11 55	16	
nde Gab -	2 41	2		Kouloi River -	1 15	20	
minde -	3 34	2		Mezen -	1 48	15-22	
and or Horn } -	1 44	5		Kerets Point, Gulf } -	4 30	5½	
nt - }				of Arkhangel - }			
minde -	4 9	2		Nikolskoi Tower "	6 0	2	
als -	4 28	1		Moudinga I. "	5 50	3½	
n or the Skaw -	5 56	1		Dvina Bar -		3½	
n -	1 30	4		Arkhangel "	7 28	2½	
als Islands -	10 45	6		Nikolskoi Chan. "	5 25	3	
o Fiord -	10 45	7		Gribanika Pt. "	4 50	3	
mbcia -	12 0	8		Jijginsk I. -	5 15	4	
lands -	11 45	7		Cape Orlov Letni, } -	5 18	4	
-	12 0	9	7½	Gulf of Onega - }			
n Islands -	12 0	9	7½	Onega River -	9 17	6-7	
so -	1 45	8		Souma -	6 30	5½	
erfest -	1 10	9		Solovet Road -	5 0	4	
<i>Færoe Islands.</i>				Kyem River -	5 23	4	
e Fiord -	11 15	6½	4½	Kalgalaksha -	6 50	7	
e Fiord -	12 0	6½	4½	Keret, Gulf of } -	3 8	6	
ig Fiord -	0 30	6½	4½	Kandalak - }			
ness -	3 12	6½	4½	Kandalaksha "	3 25	7	
se Fiord -	4 0	6½	4½	Sosnovaia Bay "	2 40	6	
enFiord(be- } -	5 0	9½	7½	Kou Zomen -	3 30	6	
en Stormoe }				Tetrina -	3 17	7	
Sandoe) -				<i>Nova Zembla.</i>			
" (be- } -				Hakluyt Head -	1 30	4	
en Hestoe }	5 30	9½	7½	<i>Spitzbergen.</i>			
Sandoe) -				Bell Sound -	8 56	3½	
se Fiord -	6 0	9½	7½				
nanshaven -	8 0	9½	7½				
se Fiord -	6 0	9½	7½				
ness Fiord -	9 0	9½	7½				
Fiord -	11 0	9½	7½				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Africa, West Coast.</i>							
<i>(From Cape of Good Hope to the Northward.)</i>							
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Simons Bay -	2 44	5½	3½	Monrovia -	6 0	6	
Hout Bay -	2 20	5		Gallinas River -	6 45	4	
Table Bay -	2 40	5		Gilmorris Id. -	6 0	11	
Saldanha Bay -	2 0	6		Sherbro River -			
St. Helena Bay -	2 30			Edmonstone Id. -		8	
Roodewall Bay -	2 30	6½		Bagroo River -		11	
Hondenklip Bay -	2 30	5½		Banana Islands -	8 15	9	
Mc. Dougall Harb. -	2 30	5½		Sierra Leone -	7 55	8	
Port Nolloth -	2 30	5½		Yellaboi Island -	7 10	10	
Elizabeth Bay -		5 - 6		Scarcies Rivers -	7 10	10	
Angra Pequena -	2 30	8		Mellacoree R. -	7 40	11	
Ichabo Island -	1 0	6	4	Forecarreah R. -	7 40	11	
Spencer Bay -	10 30	5 - 6		Mahneah R. -	7 40	11	
Port d' Ilheo -	3 0	8 - 10		Isles de Los -	6 35	13	
Walvisch Bay -	1 54	6		River Ponga -	7 30	12	
Port Alexander -	3 0	5		" Nunes -	10 0	15	
Great Fish Bay -	2 30			" Componee -	10 0	15	
Little Fish Bay -	2 30	5-6?		Bijouga Ids., Or-	10 0	11	
Lobito Bay -	2 20	5		ango Channel -			
Benguela -	2 30	5?		" Arcas	10 10	11 - 14	
St. Helena Island -	3 11	3		Channel -			
Ascension Island -	5 30	2		" Bissao-	11 0	8	
San Paul de Loanda -	4 30	5		River Cacheo -	7 45	8	
River Congo -	4 30	6		" Gambia -	8 10	6 - 9	
Mayumba -		7		Joombas River -	8 10	6	
River Gaboon -	5 30	3		Salm River -	8 10	6	
Cape Lopez -	4 30	4-6?		Cape Verde -	7 45	5	
Corisco Bay -	5 0	7		Senegal -	10 30		
(Elobey Isles) -				Sal, C. Verde Ids. -	7 45	5	
Anno Bom Id. -	3 45	5		Porto Praya -	6 0?	5	
St. Thomas Id. -	3 25	4½		Portendik -	10 0	6	
Princes Id. -	3 45	4½		Levrier Bay -	12 0	6 - 7	
Fernando Po -	4 0	7		Ouro River -	12 0	8 - 9	
Cameroon River -	4 0?	6		Cape Blanco -	11 46	6	
Bonny and New	5 0	9		Cape Bojador -	12 0	8?	
Calabar Rivers -				Cape Juby -		8	
Brass River -	4 0	6		Ferro, Canary Ids. -	12 30?	9?	
River Niger, Nun	4 8	6		Palma -	12 30?	9?	
(entrance) -				Gomera -	12 45?	9?	
" Benin -	4 30	7		Lanzarote -	1 0?	9?	
" Middleton -	4 15	5		Santa Cruz, Tenerife	1 30	8	
" Pennington -	4 15	5		Puerto de la Luz, }			
" Dodo -	4 17	5		Gran Canaria - }	12 52	10	
" Ramos -	4 20	5		Santa Cruz of }			
" Forçados -	4 22	5		Agadir - }	12 45	9	
" Lagos -	6 0	2		Mogador -	1 18	10-12	
Cape Coast Castle -	4 30	6		Cape Cantin -	10 0	10	
St. George d'Elmina -	4 30	6		Rabat -	1 46	9 - 12	
Cape Three Points -	4 0	4		El Araish -	1 30	9 - 12	
Axim -	4 30	4		Tangier -	1 42	8	
Grand Lahou -	4 20	4		Ceuta -	2 6	3½	
Tabou River -	4 45	3 - 4		Tetuan -	2 23	2½	
Cape Palmas -	4 30	4		Tunis (Goletta) -		3	
Sinou -	5 0	4		Jerba -	3 10	7	
Sangwin River -	5 15	4					
Grand Cestos -	5 20	4		<i>Europe, West Coast.</i>			
Edina -	5 50	4		Malaga -	12 0	3	
Junk River -	5 45	5		Gibraltar, old Mole -	2 20	3½	
				Algeciras -	1 49	4	
				Tarifa -	1 46	6	

Place.	High Water, Full and Change.	Tide.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
ina Rocks -	1 45	9½		Concarneau -	3 12	13	9½
ina Rocks -	1 24	12½	8	Penmark Rocks -	3 16		
ina Rocks -	1 27	12½	8	Glenan Is. -	3 12	11	10
ina Rocks -	1 34	12½	8	Ile de Sein -	3 21	17½	11
ina Rocks -	1 53	12½	8	Brest -	3 47	19	13½
ina Rocks -	2 0	12½	8	Conquet Road -	3 46	21	15
ina Rocks -	1 18	11½	7½	Ushant -	3 32	19½	13½
ina Rocks -	2 7	13					
ina Rocks -	2 30	8		<i>South America, East Coast.</i>			
(Belem) -	2 30	12	9	<i>(Cape Horn to the Northward.)</i>			
ina Rocks -	1 54			St. Martin Cove, } -	3 50	8	
go (Bar) -	2 30	7		Cape Horn Ids. } -			
ina Rocks -	2 30	10		Cape Peñas -	6 42	12	
Azores -	11 45	4		Cape San Diego -	4 30	10	
ina Rocks -	12 33	4½		Orange Bay -	3 30	6	
ina Rocks -	12 30	6		Goree Road -	4 0	8	
ina Rocks -	12 48	7		Le Maire Strait -	4 0	7	
ina Rocks -	3 0	12-13		Staten Island -	4 30	8	
ina Rocks -	3 0			San Sebastian Bay -	7 0		
ina Rocks -	3 0	11		<i>Falkland Islands, East Falkland.</i>			
ina Rocks -	3 0	15		Berkeley Sound -	5 0	7	
ina Rocks -	3 0	15		Port William -	5 15	7	5½
ina Rocks -	3 0	15		Port FitzRoy -	4 45	6	
ina Rocks -	3 0	15		Port Pleasant -	5 0	6½	
ina Rocks -	3 0	15		Island Harbour, } -	5 20	6	
ina Rocks -	3 0	15		Choiseul Sound } -			
ina Rocks -	3 15	15		Mars Harbour -	6 0	6	
ina Rocks -	3 30	15		Darwin Harbour -	6 30	5½	
ina Rocks -	3 30	15	12	Walker Creek -	6 20	5½	
ina Rocks -	3 30	12½	10½	Low Bay -	5 0	5½	
ina Rocks -	3 0	11		Adventure Sound -	5 30	5½	
ina Rocks -	3 15	12		Bay of Harbours -	6 0	5	
ina Rocks -	3 20	11		Falkland Sound N } -	6 45		
ina Rocks -	3 0	12	9	entrance } -			
ina Rocks -	3 0	12	9	" S. entrance -	7 0		
ina Rocks -	3 19	12½	8	Ruggles Bay -	7 30		
ina Rocks -	3 45	12	10½	Port King -	7 30	5	
ina Rocks -	3 39	8½	6	" Sussex -	8 15	6	
ina Rocks -	4 37	11½	9½	" San Salvador -	8 10		
ina Rocks -	3 37	13½	10½	" San Carlos -	7 0		
ina Rocks -	3 38	13½	10				
ina Rocks -	4 11	11½	11	<i>West Falkland.</i>			
ina Rocks -	6 50	14	12½	Port Stephens -	7 45	7½	
ina Rocks -	3 20	17	12½	" Albemarle -	7 15	7	
ina Rocks -	3 50	11		" Edgar -	7 15	6	
ina Rocks -	4 6	17	13	Fox Bay -	7 0	6	
ina Rocks -	3 31	17	11	Manybranch Harb. -	7 40	7½	
ina Rocks -	3 26	14	10	Port Egmont -	7 30	11	
ina Rocks -	3 31	15	11½	Hope Harbour -	8 10	7	
ina Rocks -	3 6	14½	10	Shallow Harbour -	9 30	6	
ina Rocks -	3 2	16	11½	Ship Harbour, New } -	10 30		
ina Rocks -	3 42	11	9½	Island - } -			
ina Rocks -	3 10	15½	11				
ina Rocks -	3 18	14½	10½	<i>South America, East Coast—continued.</i>			
ina Rocks -	3 11	13	9½	Coy Inlet -	9 30	11	
				Port Gallegos -	8 50	11	
				Santa Cruz River -	9 30	40	29

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neap
	h. m.	ft.	ft.		h. m.	ft.	ft.
Port San Julian -	10 45	30		English Harbour, }		2	
„ Desire -	12 10	18½		Antigua - }		1½	
„ Melo -	3 40	15		Anegada -	9 0	1½	
„ Santa Elena -	4 0	17		Gorda Sound, }	8 30	1½	
Nuevo Gulf -	7 0	10		Virgin Island - }	8 30	1½	
Port San Josef -	10 0	30	25	Tortola -	8 30	1½	
Sea Bear Bay -	12 45	20		Culebra or Pass- }	9 0	1	
Port San Antonio -	10 40	28		age Island - }			
Rio Negro -	11 0	14		Christiansted, }	7 30	¾	
San Blas -	2 0	12	10	Santa Cruz - }			
Colorado River -	4 0	9	7½	San Juan, Porto }	8 2	1½	
Union Bay -	3 10	12	9	Rico - }			
Port Belgrano -	6 0	12	10	Saintes -	6 45		
Tristan d'Acunha -		8		Inagua -	8 0	3½	1
Rio de la Plata -	noon	irr.	irr.	Mira-por-vos -	9 30	3	1
Buenos Ayres -	noon	irr.	irr.	Stirrup Cays -	7 0	4	
Santa Catharina I. -	2 30	3		Crooked Island -	7 0	2½	
San Sebastian -	2 0	4		Exuma -	7 20	2½	
Ilha Grande -	12 30	5	4	Clarence Harbour, }	8 30	4	1
Rio Janeiro -	3 0	4	3	Long Island - }			
Porto Frio -	2 40	4½		Rugged Island -	8 0	3	
Benevente -	3 0	5		Mucaras Reef -	7 40	3	
Nostra Santa de }	3 0	4		Lobos Cay -	7 40	3	
Victoria - }				Guinchos Kay -	7 40	3	
Abrolhos -	4 48	6		Nassau, New Pro- }	7 30	3-4	
Martin Vas Rocks -	3 45			vidence - }			
Os Ilheos -	4 30			S. W. Bay „ -	7 30	4	
Bahia -	3 30	8		Salt Cay Anchorage -	8 15	4	
Maceio -	4 30	8½		Hanover Sound -	8 15	4	
Pernambuco -	4 45	8	6	Douglas Road -	8 30	4	
Parahayba -	5 0	9-12		Abaco -	8 0	3	
Cape St. Roque -		8-10		Gun Cay -	8 30	3	
As Rocas -	5 15	10		Memory Rock -	7 50	3	
Fernando Noronha -	4 0	6		Bluff Cay -	7 0	4½	
Aracati -	6 0	8		Puerto de la Plata, }	7 30	3?	
Jericoacoara -	11 30	12	6	St. Domingo - }			
Maranham -	7 0	17½		Mancenille Bay -	7 0	4-5?	
San Joao -	6 24	14		Fort Dauphin -	7 0	5½	
Para -	12 0	11	10½	Cape Haïti, St. }	6 0	3	
Cayenne River -	3 45	6		Domingo - }			
Maroni River -	5 30	8		Lacul Harb. „ -	6 0?	3?	
Surinam -	6 0	5½		Gonaives Bay „ -	8 0?	1?	
Corentyn River -	5 10	8½	6	Bay of St. Mark „ -	8 0?	1?	
Berbice -	4 30	11?	6	Port au Prince „ -	8 0?	1?	
Demerara River -	4 45	9	6	Caïmites „ -	8 0?	1?	
Orinoco R. (entr.) -	6 0	3		Bay of Aux Cayes „	uncertain	2-3?	
Chacachacare Id., }	3 30	4		Flamand Bay „ -	„	2-3?	
Trinidad }				St. Louis Bay „ -	„	2-3?	
Dragons Mouth „ -	3 0	4		Aquin Bay „ -	„	2-3?	
Port Spain „ -	4 30	4	3	Jacmel „ -	„	2-3?	
Tobago -	irr.	3½		Havana, Cuba -		3	
Cartagena -	11 0	1½	1	Cape St. Antonio, }		1½	
Caledonia Harbour	11 40	1½	1	Cuba - }			
<i>Caribbean Sea and the Bahamas.</i>				Port Royal, Ja- }	11 0	1	
				maica - }			
Barbadoes -	irr.	2		<i>Bermudas.</i>			
Grenadines -	3 0	1½		Ireland Id. Dock }	7 14	4	
Grenada, (St. }	2 40	1½	¾	Yard - }			
George Harb.) }							

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
America, East Coast. (Isthmus of Panama to the Northward.)							
	h. m.	ft.	ft.		h. m.	ft.	ft.
San Juan -	9 0	1½		St. Augustine* -	8 21	5	4
Islands -	1 50	2		St. Johns River* -	7 28	5½	5
Florida Cay, } -	1 45	2		Fort Clinch, Fernandina* -	7 53	6½	6½
Cays -	2 0	2		St. Simons Island* -	7 43	8½	6½
War Cay -	8 10	4		Doboy Lighthouse* -	7 33	7½	7
Gracias Harb. -	10 30	2		Savannah (City)* -	8 13	7½	6½
Harbour, } -	7 45	3½		Fort Pulaski, Savannah (entr.)* -	7 20	8	7
San Juan Bank -	irr.	2		Hilton Head* -	7 19	7½	6½
Bank -		2		St. Helena Sound* -	7 8	7½	6
Evidence -	irr.	1		North Edisto R.* -	7 10	7	5½
Island -	9 0	1½		Charleston* -	7 26	6	5
San Juan Harbour -	9 30	1½		Bulls Island Bay -	7 16	5½	4½
San Juan -	8 30	1½		Georgetown* -	8 40	4½	3½
Stoche -	9 30	1	2	Island* -	7 56	4½	3½
San Juan -	1 45	2½		Wilmington* -	9 6	3	2½
San Juan -		2		Cape Fear River (Smithville)* -	7 19	5½	4½
San Juan de Terminos -	noon	1½		Bald Head* -	7 26	5	4½
San Juan -		1½		Beaufort* -	7 26	3½	2½
Locks -	noon	1½		Ocracoke Inlet* -	7 4	2½	2
San Juan -		2		Hatteras Inlet* -	7 4	2½	2
United States. (Louisiana, Mississippi, Florida, Georgia, and S. & N. Carolina.)				(Chesapeake Bay and Rivers.)			
R. (entr.)* -	irr.	1½	¾	Cape Henry -	7 40	4	
Pass, Texas* -		1½	¾	Cape Charles -	7 45	5	
San Juan -		1½	¾	Old Point Comfort* -	8 17	3	2½
Pass* -		1½	¾	James R., City Point* -	2 11	3	2½
San Juan River* -		2½	1½	Richmond* -	4 28	3½	2½
San Juan Bay -		2½	1½	York R. (Moody's Wharf) -	9 35	3½	
San Juan (entrance)* -	irr.	2½	1½	Potomac River (Cherry Point) -	10 5	2	¾
San Juan Bay* -	irr.	2-2½		Tappahannock* -	0 42	2	1½
San Juan Bay* -	irr.	2		Rappahannock (Saunders Wharf) -	3 2	2½	2
San Juan Bay -	irr.	1½		Point Lookout* -	12 58	2	1½
San Juan S.W. pass -		1½	¾	Annapolis* -	4 38	1	1
San Juan -	irr.	2		Chester R. (Rock-hall Creek)* -	5 23	2½	1
San Juan -	irr.	1-2		Patapsco River (Bodkin Point)* -	5 42	1½	1
San Juan -		1½		Baltimore* -	6 33	1½	1½
San Juan Bay* -	irr.	1-2		(Delaware Bay and River.)			
San Juan Sound (entrance)* -	irr.	2½-4		Cape Henlopen -	8 0	4½	
San Juan (entr.)* -	1 31	1½	1½	Delaware Breakwater* -	8 0	4½	3½
San Juan Bay -		2½-4		Higbees, Cape May* -	8 33	6½	5½
San Juan -	1 14	3	2½	Egg Island Light* -	9 4	7	5½
San Juan -	0 51	3½	2½	Mahons River* -	9 52	7	5½
San Juan Bay* -	11 21	1½	1½	New Castle* -	11 53	7	6½
San Juan -	9 56	1½	1	Philadelphia* -	1 18	6½	5½
San Juan -	9 30	1½	1½				
San Juan, N.W. -	9 10	1½	1½				
San Juan -	8 40	2	1				
San Juan -	8 23	2½	1½				
San Juan -	8 34	1½	1½				

From the United States Coast Survey, the times of High Water being the Corrected and not the Vulgar Establishment.

Place.	High Water Full and Change.	Rise.		Place.	High Water Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
(New Jersey.)							
	h. m.	ft.	ft.		h. m.	ft.	ft.
Cape May Landing*	8 19	6	5	St. George Shoals	10 30	7	
Cold Spring Inlet*	7 32	5½	4½	Monomoy* -	11 58	5½	
Little Egg Harbour	7 10	4½	3½	Provincetown* -	11 22	10½	
(Long Island Sound.)				Wellfleet* -	11 5	13½	
Watch Hill* -	9 0	3	2½	Cape Cod -	11 30	13	
Stonington* -	9 7	3½	3	Barnstable -	11 22	10	
Little Gull Island*	9 38	3	2½	Plymouth* -	11 19	11½	
New London* -	9 28	3	2½	Boston Light* -	11 12	11	
New Haven* -	11 16	6½	5½	Boston (Charles-			
Bridgeport* -	11 11	8	6½	town Naval Yd.)*	11 27	11½	
Sheffield Island* -	10 58	8½	7½	Marblehead -	11 30	12	
Oyster Bay* -	11 7	9½	8	Salem* -	11 13	10½	
Sands Point*	11 13	9	7½	Gloucester Harbour*	11 4	10½	
New Rochelle* -	11 22	8½	7½	Rockport* -	10 57	10½	
Throgs Point* -	11 20	9½	7½	Annisquam* -	11 0	10½	
(New York to Portland.)				Ipawich* -	11 26	10½	
Tarrytown* -	9 57	4	3½	Newburyport* -	11 22	9	
New York* -	8 13	5½	4½	Portsmouth* -	11 23	10	
Sandy Hook* -	7 29	5½	5	Portland* -	11 25	10	
Hell Gate Ap-				Kennebec River			
proaches* :				(Hanniwells	11 15	9½	
— Long Island				Point)* -			
(Blackwells Dk.)*	9 59	6	5½	Mount Desert Id. -	11 10	13	
— — N. of Anto				Bay of Fundy, Nova Scotia.			
ria Ferry* -	9 48	6½	5½	Cape Sable, Bar-			
Pot Cove,				ington Bay,	8 27	8½	
(S.E. part)* -	10 48	8½	6½	(Clam Point) -			
— Wards Island				Cape Sable, Clarke's	8 58	11	
(Paupers Dock)*	10 9	6½	5	Harbour -			
Montauk Point* -	8 20	2½	2	Pubnico -	9 26	12	
Block Island* -	7 36	3½	2½	Argyle, (Jones	9 27	12½	
Point Judith* -	7 32	3½	3½	Anchorage) -			
Newport* -	7 45	4½	4	Seal Island (Cape	9 49	12½	
New Bedford, en-				Sable) -			
trance* -	7 57	4½	4	Ellenwoods An-	9 54	13	
Bird Island Light*	7 59	5½	4½	chorage -			
Kettle Cove* -	7 48	5	4½	Jebogue -	10 4	15	
Cuttyhunk* -	7 40	4½	3½	Yarmouth -	10 9	16	
Quicks Hole				Sandy Cove E.,	10 33	21½	
(S. Side)*	7 36	3½	3	St. Mary's Bay			
" (N. Side)*	7 31	4½	3½	Petit Passage -	10 41	22	
Menemsha Bight*	7 45	4	2½	Grand Passage -	10 43	20½	
Woods Hole (entr				Sandy Cove, West	10 47	23	
from Vineyard	8 34	2	1½	Digby Gut -	11 0	27½	
Sound)* -				Port George -	11 17	32	
— (entrance from				Ile Haute -	11 21	33	
Buzzard Bay)*	7 59	4½	4	Black Rock -	11 29	36	
Tarpanlin Cove* -	8 4	2½	2½	Spensers Anchorage	11 42	39	
Gay Head -	7 37	7		Paraboro, Basin	12 17	43	
Holmes Hole* -	11 43	1½	1½	of Mines			
Edgartown* -	12 16	2½	2	Horton Bluff -	12 30	48	
Hyannis* -	12 22	4	3	Noel -	12 41	50½	
Nantucket* -	12 24	3½	3	Bay of Fundy, New Brunswick.			
				Seal Cove, Grand	10 54	20	
				Manan -			
				Machias, Seal Is-	11 5	18	
				land -			

* From the United States Coast Survey, the times of High Water being the Corrected and a Vulgar Establishment.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
<i>Prince Edward Island.</i>							
1 Harbour, } and Manan - }	11 7	21	17½	East Point -	8 30	3½	2
Quoddy -	11 12	21	17	Cardigan Bay -	8 40	5	3½
Head, Grand } Manan - }	11 16	22½	18½	Cape Bear -	9 0	6	3
Man -	11 18	24½	21	Charlottetown -	10 45	9½	7
King Harbour -	11 19	23½	20	Crapaud -	10 0	8	6
Robello } elebpool) - }	11 21	23½	20	Bedeque Harbour -	10 15	7	5
John Harbour -	11 21	27	23	Minimegash -	3 30	5	3
" -	11 35	30	25	Egmont Bay -	3 0	4	2
"Cove (near } Chignecto) }	11 35	37	30½	Cascumpeque Hr. -	5 40	3	2
Stone Island -	11 47	41	34½	Richmond Harb. -	6 0	3	2
Point of Petit- } liac River - }	11 49	45	38	Cape Turner -	6 10	4	2
Merland Basin, } St. John's (ville) - }	11 55	45½	38	Grand Rustico -	6 40	4	2
				Tracadie -	7 0	3½	2
				St. Peter Harbour -	8 30	4	2½
				Boughton Harb. -	8 40	5	2½
<i>Cape Breton Island.</i>							
				Port Hood -	9 0	4½	2
				Gut of Canso } (Plaister Cove) }	9 15	4	2
				Mabou River -	9 0	4	
				Chetican -	8 15	3½	
				Cape North -	8 0	4	
				St. Anne Bay -	8 34	6	4½
				Sydney Harbour -	8 15	5	4
				Menadou Bay -	8 15	5½	
				Louisburg Harb. -	8 0	5	4
				St. Peter Bay -	7 30	6	4
				Habitants Harbour -	8 20	6½	4½
				Arichat -	8 10	5	4
				Bear Head -	8 30	4½	3
				Poulament Bay, } Madame Island - }	7 50	6	4
				Grande-digue, " -	7 55	6½	4½
<i>Labrador and Gulf St. Lawrence.</i>							
				St. Lewis Cape -	6 30		
				Chateau Bay -	7 35	3½	1
				Red Bay -	7 45	3½	1½
				Bradore Bay -	8 45	4	2
				Belles Amour Bay -	9 0	4½	2½
				Bonne Esperance } Harb. - }	9 15	5	2½
				Mistanoque -	10 30	6	3
				Antrobus Island -	10 30	5	3
				Wapitagan Harbour -	10 30	5	3
				Coacocho Bay -	10 30	5	3
				Kegashka Bay -	10 45	5	3
				Little Natashquan -	11 0	5	3
				Appetit Bay -	11 10	5½	3½
				Betcheween Har- } bour - }	11 32	5	3
				Clearwater Point -	11 30	5	3
				Mingan Harbour -	1 16	6	4
				Mingan Island -	1 30	6	4
				Bay of Seven Is- } lands - }	1 40	9	5
<i>Nova Scotia.</i>							
				Harbour -	8 12	7	5½
				Arne -	8 4	7	5½
				St. John's Island -	7 59	7½	6
				Monton -	7 54	7½	5½
				pool Bay -	7 50	8	5
				Metway -	7 50	8	5
				le Have } spectacle Id.) }	7 48	7	5½
				Island, N side	7 30	4	
				" S. side	6 30	4	
				ix Harbour -	7 49	6	5
				e Harbour -	7 45	6½	4½
				Harbour -	7 54	6½	4½
				Harbour -	8 6	6½	4½
				nb Harbour -	8 0	6½	4½
				r Harbour -	7 40	6½	4½
				haven -	8 0	6½	4½
				Harbour -	7 48	6½	4½
				Harbour -	8 0	6½	4½
				orough -	8 20	6½	4½
				-	9 15	4	2½
				George -	9 15	4	2
				omish -	10 6	5½	3½
				Harbour -	10 0	6	4
				a Harbour -	10 0	6	4
				Sound -	10 30	8	5
				agouche -	10 0	8	5
				e Harbour -	10 30	8	5
				sh Harbour -	10 30	7	4
				erte -	10 0	9	5
<i>New Brunswick.</i>							
				ain Island -	9 30	6	3
				: Harbour -	{ 1 0 } 8 0 }	4	2

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neap.
	h. m.	ft.	ft.				
Anticosti Island } (East Cape) -	1 0	5	3	<i>Newfoundland.</i>			
" Bear Bay -	1 10	5	3		h. m.	ft.	ft.
" West Point -	2 0	6	4	St. Pierre -	8 33	6½	4½
Cawee Islands -	1 50	9	5	Lamalin Harbour -	9 15	8½	
Egg Island -	2 0	11	6	Great and Little } Laun -	8 15	7	4
Point de Monte -	12 0	12	6	Great St. Law- } rence Harbour	8 30	7	4
Cape Chatte -	12 0	13	8	Barin Harbour -	8 45	6½	4½
Godbout River -	1 52	11	6	St. Mary Harbour -	7 40	7½	5
St. Nicholas Harb.	1 55	12	7	North Harbour -	8 0	7½	5
Manicouagon River	2 15	12	7	Cape St. Mary -	8 30	7	5
Bersimis River +	2 0	12	7	Placentia -	8 30	7	■
Bic Island -	2 15	14	8½	Trepassey Harbour	7 0	6½	5
Port Neuf -	2 10	13	8	St. Johns -	7 30	7	
Matan River -	2 15	11	7	Harbour Grace -	7 30?	7?	
Little Metis -	2 10	13	8	Bull Id., Trinity Bay	7 22	3½	2
Saguenay, Tadoussac	2 45	17	10	Barrow Harbour -	7 10?	5?	
" Chicoutimi	4 11	12	8	Fogo Island -	7 20	4	
<i>River St. Lawrence.</i>				Funk Island -	7 0?	2-3?	
Green Island -	2 45	16	9½	Triton Harbour -	7 0?	2-4?	
Brandy Pots -	3 0	17	10	Cutwell Harbour -	7 0?	2-4?	
Coudres Island } (Prairie Bay) -	4 25	17	10	Fleur de Lis Harb.	7 0?	2-4?	
Pillars -	5 0	17	10	Rouge Harbour -	7 0?	2-4?	
Crane Island, } Middle Traverse	5 24	17	13	Croc Harbour -	6 30?	4?	
Orleans Island, } North Traverse	5 40	17	13	St. Julien Harbour {	7 21 A.M. 6 30 P.M.	4½	2
Quebec -	6 38	18	13	Goose Cove -	7 0?	2-3?	
Carouge River -	7 15	16	11	Braha Harbour -	7 0?	2-3?	
Frechette Island -	8 0	14	9	Lunaire Bay -	7 0?	2-3?	
Port Neuf -	8 30	14	9	Griguet Bays -	7 0?	2-3?	
Grondine -	9 0	9	6	Sacred B., (N. Cst.)	7 23	2½	
Cape Roche -	9 30	6	4	Cook Harb. (N. Cst.)	7 25	3?	
Champlain -	9 45	3	2	Port-au-Choix, } (N. W. Coast) -	10 47	■	
Batiscan -	9 48	3½	2	Petit Port, Bay of }	10 42	5½	
Antigonish Harb. -	9 0	4	2	Islands -			
Three Rivers -	11 30	1		Codroy Island -	9 15	6	4
<i>Gulf St. Lawrence.</i>				Port Basque -	8 55	5½	4
St. Paul Id. -	6 0	5	3	La Poile Bay -	9 0	6	4
Magdalen Islands -	6 20	3	2	<i>Hudson Strait.</i>			
Gaspé Basin -	2 40	5	3	Button Islands -	6 50		
Point Macquereau-	2 0	5	3	Fury and Hecla } Strait, Melville	7 0	8	
Carleton Point -	3 0	6	4	Peninsula -			
Dalhousie Harb. -	3 10	9		<i>Hudson Bay.</i>			
Campbell Town, } Ristegouche R. }	4 0	10	7	York Factory -	11 15	10-14	
Bathurst -	3 15	7	4	<i>Arctic Regions, Greenland, West Coast.</i>			
Shippigan -	3 42	5½	3	Julianshaab -	5 6	7	
Caraquette Harbour	2 40	6	3	Fredericksaah -	6 3	12½	
Miscou -	2 30	5	3	Holsteinborg -	6 30	10	
Miramichi Bar -	5 30	5	3	Upemvik -	11 0	8	
Sheldrake Island -	6 0	5	3	Wolstenholm } Sound -	11 8	7½	
Vin Harbour -	5 45	5	3				
Beaubère Island -	6 30	6	4				
Point Escumenac -	4 10	4	2½				
Richibucto River -	3 30	4	2½				
Bactouche River -	7 0?	4?	2?				
Cocagne River -	7 30?	4?	2?				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Barrow Strait.</i>					<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Leopold	12 6	6	4½	Port Cockburn, }	4 15	12	
s Bay	12 6	8		Pemba Id. - }	4 0	11	
h Island	12 15	3½	2½	Melinda -	4 15	11	
<i>Melville Island.</i>				Lamo Harbour -	4 6	11	
r Harbour	1 30			Patta Bay -	4 30	10	
<i>Banks Land.</i>				Port Durnford -	4 45	12	
f Mercy		2		Brava -	4 30	8	
s of Wales }		3		Magadoxa -	4 30	8	
ut - }				Ras Haffun -	6 15	4	
<i>Africa, South Coast.</i>				Bander Aluleh -	6 45	6	
s Bay	2 44	5½	3½	Bander Gori -	8 45		
Island	2 50	5		Berberch or }			
Agulhas	2 50	5		Burburra (Gulf }	7 15	9	
l Bay	3 15	6		of Aden) - }			
Harbour	3 45	11		Zeyla -	7 15	8½	
oberg Bay	3 10	6		Ghubbet Na, Socotra	7 0	7	
Bay or Bay }	3 30?	6?		Gollonsir -	7 20	8	
Bras - }				Bander Shabab -	7 0	7	
Bay	4 0	4-5		Abd-al-Kuri -	8 30	6	
lands	4 0	4-5		Kal Farun -	8 20	6	
loo Bay	4 0	6		<i>Madagascar, East Coast.</i>			
o River (en- }	3 45	4½		British Sound -	4 0	9½	
ice) - }				Port Leven -	3 30	7½	
ha River	4 0	5		Andrava Bay -	3 30	7	
Natal	4 30	6		Antongil Bay }	4 0	5	
a Bay, Eng- }				(Port Choiseul) }			
River (Por- }	5 20	12		Tangtang Harbour	4 30	6	
ese Factory) }				Madame Island, St. }	4 0	5	
Port Melville }	4 30	15		Mary Harbour }			
between Island }	4 40	12		Tamatave -	4 18	8	
<i>Africa, East Coast.</i>				Fort Dauphin -	4 30	7	
shane River	4 15	10		<i>Madagascar, West Coast.</i>			
Bazaruto	4 15	10		St. Augustine Bay	4 30	11	
River	4 0	19		Noss or Sandy Id.	5 0	11	
same River }	4 15	16		Cape St. Vincent -	4 45	12	
rance) - }				Mourondava -	4 45	12	
River (en- }		22		Barren Islands -	4 45	11	
ice) - }				Boteler River -	4 30?	15?	
za River		13		Boyanna Bay -	4 30	15	
ambique Har- }	4 15	12	11	Makumba River -	4 45	17	
r - }				Bemhatooka Bay -	4 30	11	
a Bay	4 0	11		Majambo Bay -	4 30	16	
Harbour	4 15	6		Narrinda Bay -	4 30	15	
o Island	4 30	7		Port Mazambo -	4 30	11	
Delgado	4 0	16	11½	Port Radama -	4 40	13	
na River	4 0	16	11½	Passandava Bay -	5 0	11	
River (en- }	4 15	12		Dalrymple Bay -	5 0	11	
ice) - }				Minow Islands -	5 0	15	
allo or }	4 45	12		St. Juan de Nova -		5	
guallo River }	4 45	12		<i>Red Sea.</i>			
a Island	4 0	10		Bab-el-Mandeb St.	12 0	7	
er (Channel)	4 15	11		Mocha Road (East }	12 0	4½	
er - }	4 20	10		Coast) - }			
Channel - }	4 0	11		Murdoonnah Island }	6 0	3	
				(East Coast) - }			
				Ushruff Islands -	6 14	2	
				Massowah -	1 0	3	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.	<i>Hindoostan, West Coast.</i>			
Omaider Island } (Gulfof Akabah)	6 0	4		Manora Point (en- trance to Karachi Harbour)	10 30	9½	
Rás Mahommed } (Gulfof Akabah)	6 0	5		Gizree Bunder } (Mouth of Indus)	9 50	7	
Jiddah -	-	2		Pitty " -	10 5	9	
Sale Macowa -	0 30	2		Dunbar " -	10 10	8	
Loheia -	1 30	3		Kedewarry " -	9 57	9	
Suez Bay (head of Gulf)	2 0	6		Hukkar River (en- trance)	10 30	11	
<i>Arabia, S.E. Coast.</i>				Koree River (Mon- da Point)	11 40	11	
Bab-el-Mandeb } Strt. (Perim Id.)	12 0	7		Bate (Gulfof Cutch)	12 20	12	
Bander Feikam -	10 0	8½		Jooria " -	2 0	16	
'Aden (Back Bay)	9 30	8½		Gooriya " Creek } (entrance)	11 0	9	
Sughrá -	8 0	6		Mandavee Roads -	11 50	15	
Makâtein -	9 0	6		Jaffrubat -	11 35	9	
Rás-al-'Asidah -	8 30	5½		Ranjpoor (entrance, Gulf of Cambay)	2 15	18	
Makalleh -	8 30	7		Diu Island -	2 0	6	
Rás Sharmah -	9 0	8		Surat -	4 0	19	
Merbat -	9 0	6½		Damsun (Bar) -	1 30	17	
Kuriyán Muriyán } Bay & Islands	8 20	6½		Versavah -	0 15	16	
Cape Isolette -	9 0	10		Nansaree River, } (Bar)	3 0	18	
Sháb Kadún -	9 20	10		Gundavee River } (entrance)	2 0	19	
Jezírat Hamar-al- nafur -	9 30	10		Bulsaur R. (entr.)	1 45	18	
Sháb-'bu-saifeh -	9 45	10		Omersary River " -	1 45	18	
Ghubbet Hashish -	10 0	10		Dauoo River " -	1 30	17	
'Om-rasas-Masirah	10 0	10		Manorah River " -	1 30	16	
Rás Shébali -	10 0	10		Bombay Dockyard	11 40	12-17	
Rás-al-Hed -	9 30	9		Rajahpoor Harbour	11 0	12	
Khór Jerameh -	9 30	10		Bancoot River } (entrance)	2 0	12	
<i>Persian Gulf.*</i>				Geriah Harbour -	2 40	9	
Maakat -	11 15	■		Angria Bank -	10 30	9	
Jezírat Jún -	11 30	10		Dewghur Harbour -	11 25	9	
Rás al Kheí meh -	11 45	7		Goa -	11 30	6	
Al Bida' -	8 30?	6?		Sedashigur Bay† -	10 0		
Bahreín -	5 30	7		Agoda Point -	10 30	9	
Jezírat Arabi -	6 30?			Merjee River -	11 0	7	
Jezírat Kahr -	-	8½		Calicut Roads -	0 15	5	
Koweit -	0 15	9		Beypoor River (en- trance)	0 15	5	
Basrah (Bar) -	12 0			Cochin Harbour } and Road	1 0	3½	
Jezírat Kharg or } Kháreg -	8 0	6½		<i>Ceylon, South Coast.</i>			
Abú-shehr -	7 30	7		Colombo -	1 0	2	
Umm en Nakheil- lah -	7 30?	8?		Dodandowe Bay -	1 50	1½	
Tabrí -	5 0?			Pointe de Galle -	2 0	2	
Jezírat Knis -	0 45	7½		Belligam or Red Bay	2 20	2½	
Jezírat Tumb -	-	8		Kirindi -	3 30		
Lingeh -	12 0?						
Básidúh -	12 0	10					
Kesm -	11 0	12					
Jezírat Lárek -	10 15						
Basrah Town -	6 0?	9					

* Deduced from observations made in the E.I.C. brig Euphrates 1857-58, and H.M. schooner *Maori* the Indian Navy, 1858-60, by Commander G. C. Constable and Lieutenant A. W. Stiffe of the Indian Navy.

† Spring tides rise, a.m. 6 feet, p.m. 7½ feet from October to March; and the contrary during the of the year.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
also River -	5 0	2-3		St. Paul Island -	11 0	3	
malee Har- }	8 18	2	1½	Amsterdam Id. -	11 0	3	
ira Point -	9 30	7-11		Mauritius, Port }	12 30	3	2½
<i>Bay of Bengal, West Coast.</i>				Louis - - }			
arin Har- }				" Grand }	1 0	1½	
and Road, }	1 15	2½	1½	Port - - }			
f of Manar) }				Reunion or Bour- }	Noon	3½	
urry -	11 0			bon Island, }			
ben Pass -	1 30	2		(St. Pierre) }			
atnam(West }				" (St. Denis) -	0 22	2½	
of Falk }	11 0	1½		" (St. Gilles) -	1 0	2½	
t) -				" (St. Paul) -	1 7	4	
atam -	5 0	3		Rodrigue Island -	1 45	6	
e -	8 15			Cargados Garayos }	2 0	4	
as Road -	7 34	3½		Shoals -			
st Shoals -	9 25	2½		Chagos Archipel- }	1 30	6	
Point -	8 0	8		ago, (Diego }			
Divy -		5		Garcia) -			
ga Bay -	9 10	4-5	3	Seychelle Archi- }	4 0	6½	
River (Bar) }	9 0	5		pelago, (Mayhé }			
ore River -	10 0	15		Island) -			
ree -	11 30			Curieuse Island -	5 10	7	
r Island -		12		Peros Banhos -	1 30	5	
ern light ves- }				Amiranté Isles, }	5 0	8½	
(entrance to }	10 0	10½		(St. Joseph I.) }			
ogly) -				Comoro Islands, }	3 30	8½	
h River (en- }				(Johanna Island) }			
nce to Bid. }	10 0	14		Comoro Islands, }	4 10	11½	
River) -				(Mayotta Is- }			
h River }	11 45	11		land, N.W. end) }			
uda Kali) -				Maldives, Adou }	1 0	4	
tta -	2 30			Atoll }			
<i>Bay of Bengal, East Coast.</i>				" Suadiva }	1 0	4	
ags Harbour }				Atoll }			
ergui Archi- }	10 40	13½		Maldives, Adou }	3 0	4	
ago) -				Matte Atoll }			
ai -	10 30	18		" Malé }	12 30	3	
y River, (en- }				" Malcolm }	10 30	3	
trance) }	10 30	20		Atoll }			
nain " -	2 0	22	17	" Heawandou }	9 30	5	
ban -	2 20	21		Pholo Atoll }			
m.R.(entrance) }	3 15	21	14	Laccadives, Cher- }	10 0	7	4
son -	3 30	21	14	baniani Reef }			
in River }	10 0	9	6	Tamareed, Socotra }	7 20	8	
rance) -				Keeling Islands }	5 30	5	
ee Road -	10 0	12		(Port Refuge) -			
b, Aracan }	9 45	9	6	Christmas Id. -	10 0		
er (Bar) -				Nicobar Islands, }			
River (en- }	10 0			Nancowry Har- }	9 15	8½	
ce) -				bour -			
ba Island -	11 30	8		Andaman Islands, }	10 0	8½	
nd Island -	10 30	8		Port Cornwallis }			
gong (Bar) -	1 15	11	10	" Andaman }	10 24	9½	
<i>Islands in Indian Ocean.</i>				Straits }			
elen(Christ- }	2 0	2		Junkseylon Island }	10 0	11½	
Harbour) -				(East side) - }			
<i>Malacca Strait, Malay Coast.</i>				Queda -	12 0	5½	
				Penang (George- }	12 0	9	7½
				town) -			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.				
Sumatra, N.E. Coast.							
Lt. Vessel (One Fathom Bank)	6 0	15	12	Pulo Aor	h. m.	ft.	ft.
Arroa	-	10		St. Barbe	6 0	6	
Cape Rachada	5 30	13		Badas Id., Linga	6 0 P.M.	12	
Sambilangs	-	12	10½	Bay†	-		
Malacca Road	7 30	11	8½	Delhi River	4 0	8	
Off Mount Formosa	8 0	11	8½				
Tanjong Bolus	9 30	10½	8½				
North Sands	5 30	15	12½				
Singapore, New Harbour	9 45	10	7½				
Rhio	10 0	7	5				
Sumatra, West Coast.							
Durian Strait.							
Banka Strait.							
Gaspar Strait.							
Java Sea.							
Celebes.							
Flores Sea.							
Moluccas.							
Timor, East End.							
Sumba or Sandelhout, North Coast.							
Sumbawa.							
Lombok, West Coast.							
Baly.							
Java.							

* In S.E. Monsoon.

† In N.W. Monsoon.

† From observations made in the month of September by W. Stanton, Master commanding H.M. Surveying Brig, Saracen.

Place.	High Water, Full and Change,	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Filipinas.</i>					h. m.	ft.	ft.
Zebú -	12 0	7	ft.	Port Barton } (Bubon Point) „	10 55	6	
Buluagan }	12 0	5½		Pancol „	9 40	6	
ta Ana - }	12 0	5½		Bacuit Bay „	10 0	6	
Iliolo -	12 0	5½		Cavern Island „	9 30	5½	
San Jacinto, }	6 30	6		Observatory } Island - }	11 0	5½	
ao Island - }	7 0	6		Ursula Island }	11 0	7½	
inao -	10 40	2½		(Palawan, E.C.) }	11 0?	6½?	
la (Luzon) -		6		Royalist Bay „	10 27	2¾	
Sual „	1 30	5½		Millman Island }	9 30	6¾	
aguimanoc „	10 0	9		(Palawan, West Coast) - }	9 30	5½	
at Harbour „		5		Casuarina Point „	9 30	5½	
n Bay (Min- }				Barren Island „	9 30	6	
o) - }	12 30	6		Bird Island „	9 30	5½	
iga(BuriasId.)				Tai-Tai Bay -		4	
<i>Loo Choo Islands.</i>				Batanes, Bashee } Islands - }			
Kiang -	6 28	7		Port Kok-si-kon }	11 30	3	
Donting -	6 35	8		(Formoza, East Coast) - }	11 45	7-12	
<i>Bonin Islands.</i>				Tam-Sui Harbour }	10 30	3	
Lloyd -	6 8	3		Kelung Harbour }			
Port, Hills- }	11 32	3½		(Formoza, N. Coast) - }			
ough Id. - }				<i>Babuyan Islands.</i>			
<i>China Sea, East Coast.</i>				Port Pio Quinto, }	6 0	6	
rvousIsland, }		8		Camiguin Island }		5	
neo, S.W. }		7		Port Musa, Fuga }			
st - }				or New Babuyan }			
ng Api -	4 0	9		<i>China Sea, West Coast.</i>			
ak River }	4 45	7		Romania Point, }	10 30		
oratabas en- }	4 45	13	9	(Malay Penin- }			
ce) - }	3 0	11		sula, E. Coast) }	9 44	7	
g Island -	5 45	6		Sedili River (en- }	8 50	9	
g River -	9 45	6		trance) „ }	6 0	7½	
River -	11 0	5		Blair Harbour „	11 30	5	
la River -	11 0	12		PuloTimoan(West }			
an Island -				side) - }	8 0	7	
alaum Island }				Binkang Bay (Co- }	5 7	9½	
. River - }	11 0	5		chin China) - }	5 7	6½	
ran Bay }	10 30	6-8		Tringano River }	10 0	5½	
labac Is- }	10 0	6-8?		(Gulf of Siam, }	4 0	4	
l) - }		7		West Coast) - }	7 0	2	
du Bay, }				Menam River, }	3 0	4	
neo N. Coast }				Paknam „ }			
ibangan Id. - }				Cape Liant (Gulf }			
d Point, }				of Siam, E. Coast) }			
neo, E.Coast }				Chentabun River }			
ung Islands }		8-10		(entrance) „ }			
neoE.Coast) }	10 10	6½		RockyIsland(Gulf }			
Bay (Pala- }				of Siam, E.Coast) }			
, West }	10 15	6		Pulo Panjang .			
t) - }	9 30	5½		Pulo Condore }			
y-oo-bay }	9 55	3½		(Cochin China) }			
an Bay „							
r Bay „							

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	N.
	h. m.	ft.	ft.		h. m.	ft.	
Nhatrang Bay } (Cochin China, E. Coast - }	8 30	5½		Hoo-e-tow Bay -	12 15	16	
Hon-cohe Bay „	11 30	5		Chimmo Bay -	10 20	16	
Turon Bay „	3 0	4		Chinchew Harbour	12 25	17	
Galang Bay } Hainan Island, }		4-5		Meichen Sound -	12 30	17	
Tien-pak Harbour } (China, E. Coast) }	12 0	8½		Hai Tau Strait -	12 15?	16?	
Pratas Shoal -	4 0	5		White Dog Ids. -	9 0	18	
Canton River } (entrance) - }	10 0	8		Min River, Tem- }	10 45	19	
Broadway River } (entrance) - }	11 0	7½		ple Point - }			
San-shui, Si Kiang } or West River. }		5-6		Min River, Lo- }	12 0		
Shao-king „ -		3		sing Island - }			
Wuchan „ -		1-1½		Chang-chi Island -	9 30	17	
Typa Anchorage -	10 0	7		Spider Island -	10 0	17	
Macao -	10 0	6½		Lishan Bay -	10 15	16	
Hong Kong Road -	10 15	4½		Namquan Harbour	10 0	17	
Lintin Id. Canton }	12 0	7½		Namki Islands -	8 30	17	
River - }				Pih-ki-shan Ids. -	8 30	17	
Fan-si-ak Channel }	1 0	7¼	5	Fong-whang- }			
Canton River - }				group, Bullock }	8 30	17	
Chuen-pee Point }	2 0	7¼		Harbour - }			
Canton River - }				Wan-chew River }	9 0	15½	
Kuper Id. { Mar. - }	2 40	5½		(entrance) - }			
Canton R. { May & }	1 40	5½		„ City	9 30	15½	
June - }				Tai-chow Islands -	9 0	14	
* Wham- { Mar. - }	1 40			St. George Id. }	10 20	15	
poa Dks. { April - }	1 15	7-8		San-moon Bay }			
June - }	0 30			Kweshan Islands -	9 30	14	
Canton, City -	2 40			Nimrod Sound -	10 30	20	
Ninepin Group -	10 0	5		Vernon Channel, }	9 40	14	
Tide Cove, Mirs Bay }	10 0	6½		Chusan Archi- }			
Tooni-ang Id. Bias }	8 0			pelago - }			
Bay - }				Ting-hae Harbour	11 0	12	
Tsang-chow Id. }	8 30			Poo-too Island -	8 15	12	
Bias Bay - }				Lansew Bay -	10 0	13	
Hong-hai Bay -	10 0	6½		Volcano Islands -	11 30	15	
Kin-siang Point, }	7 0			East Saddle Island	11 0	14	
Hie-chechin Bay }				Yung River, Chin- }	11 20	12½	
Cupchi Point -	8 0			hae - }			
Hai-mun Bay -	9 0	7?		„ Ning- }	1 0	9	
Cape of Good Hope	9 0	7?		po-fu }			
Clipper Road, Na- }	11 15	7		Hang-chu Bay, }	11 45	14	
moa Id. - }				Sesham Ids. - }			
Chauau Bay -	11 0	6½		„ Fog }	11 45	17	
Tongsang Harbour	11 30	12		Islands }			
Chimney Id. Rees }	11 30	12		„ Chapu }	12 0	25	
Pass - }				Road }			
Makung Harbour }	10 30	9½	7	Hang-chu Bay }			
(Pescadores) - }				(off Can-pu) - }			
Amoy, Inner Har- }	12 0	16		Gutzlaff Island -	11 30	15	
bour - }				Yang-tse Kyang }	12 0	12	
				(entrance) - }			
				„ entrance }	0 30	15	1
				to Wusung }			
				River - }			
				Shanghae -	0 40	10	
				† Langshan Crossing	1 40	12	

* At Whampoa Docks—In March, the day and night tides rise to the same level. From April to October the day tides are the higher, and from November to February the lower. In May and June the of spring tides is 4 feet, and the neaps 2 feet higher than in March.

† Deduced from Observations made in March 1861, by Commander Ward H.M.S. Actæon.

Place.	High Water, Full and Change.	Rise:		Place.	High Water, Full, and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Yellow Sea.				Tanabé Ki Chan- nel			
han-kan	h. m.	ft.	ft.	Uranouchi	h. m.	ft.	ft.
nton Island	4 30	11	9	Osaki	6 0	6	5½
tan Bay	1 30			Kata	5 55	6½	
ru Bay	1 30			Yura Harbour	6 4	6½	
hai-wei Har-	2 40			Naruto (Fukura)	6 5	6½	
ur	9 30	9		Akasi	6 17	7	
g-mun Harbour	9 30	9		Awajima (Inland	6 36	6½?	
h	10 0	7		Sea)	0 14	7	
tan (Depôt	10 0	■	6½	Tomo (Seto-uchi)	11 0?		5
ay)	10 35	6		Gulf of Tartary.			
o River	3 10	III	8-9	St. Vladimir Bay	irr.	■	
entrance)*				Napoleon Road	2 30	2½	
l Point, Gulf	4 50	7	5½	(West Coast)			
'Liau-tung)				Port Michael Sey-	5 30	3	
'Head of Gulf	5 30	10	8½	mour			
'Liau-tung				Barracouta Har-	10 0	3½	
Ho (Bar)	4 0	11		bour			
(entrance)	5 0	12		Castries Bay	10 30	6	
sittarta Saddle	4 20	10	8½	Jonquiere Bay	10 0	6	
shan Bay	2 30	8		(East Coast)			
Adams, Suli-	0 15	8		Amur Strait	11 40	5-6	
van Bay-				Kamchatka.			
" Mary	2 0	III		Avatcha Bay	3 30	6½	4½
Island				New Zealand:—South or Stewart Island.			
son Bay	11 45	8		Mason Bay	11 10	8	6
ien-whan Bay	10 10	12	8	S.W. Cape	12 0	7	5
ounter Rock	10 30	10		Port Pegasus	11 50	8	6
-yun-tan	9 0	12		Port Adventure	12 20	8	6
nton Haven)				Patersons Inlet	1 10	8	6
Hamilton,	8 30	11		Port William	12 45	8	6
orea, S.C.)				Middle Island, East and North Coasts.			
Japan Sea.				Bluff Harbour	1 18	8	6
g-hing Bay	5 20	2½		Molyneux Bay	3 0	8	6
a-liang-hai or				Otago Harbour	2 50	7	5
hoshu Harbour	7 45	7	5	(entrance)			
(orea)				Akaroa Harbour	3 24	8	6
asaki Bay				Port Cooper	3 50	7½	5½
ipon, South	7 15	9	7½	Kaikora Peninsula	5 30	8	6
ast)†				Cape Campbell	6 6	8	6
moseki	8 30	8	6	Port Underwood	6 10	8	6
(Yebisu)	5 0	2		Queen Charlotte	8 50	8	6
odadi Har-	5 0	■		Sound entrance)			
ur, Yezo Id.				Port Gore	9 0	■	6
umo Har-	5 30	6		Pelorus Sound	9 35	11	7
ur, Yezo Id.				(entrance)			
erouse Strait	10 30	6		Port Hardy	9 55	8	6
t-hama, Yedo	6 0	6½	4½	Nelson	9 50	11	10
y				Massacre Bay.	8 45	13	9
xio	6 0	5		Tasman Corner			
Simoda	5 0	3-5		Motu Pipi	9 50	14	10
Bay		5½		River, W. Ent.			
a Bay		4		Cape Farewell	9 20	14	10
ama Bay	5 50	5					
asu	7 30	7					
ami	7 30	6	5				
na	6 50	5					

* Time and rise much affected by winds.

† Deducted from observations made in Commander 1861 by Ward, H.M.S. Actæon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Nea
<i>Middle Island, South and West Coasts.</i>							
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Ruapuke Id. (Foveaux St.)	1 0	8	6	Monganui Harbour	8 15	9	7
Centre Id. (Foveaux St.)	12 15	8	6	Awanui River	7 44	7	
Preservation Inlet	11 20	8	6	Parenga renga Harbour	7 54	7	
Chalky Inlet	11 5	8	6	<i>Australia, East Coast.</i>			
Dusky Bay	11 15	10	8	Twofold Bay	10 0	7	5
Daggs Sound	11 30	8	6	Botany Bay	8 15	7-8	
Thompson Sound	11 30	8	6	Jervis Bay	6 20	6-9	
Bligh Sound	10 45	8	6	Port Jackson, North Head	8 15		
Milford Sound	9 15	8	6	Sydney	8 38	4½	4
Wanganui Inlet	11 20	7	6	Broken Bay	8 0	6-9	
<i>North Island, South and West Coasts.</i>				Newcastle or Port Hunter	9 45	6-7	
Port Nicholson, Lambton Harbour	4 30	5	3	Port Stephen	9 0	6	
Mana Island	7 0	8	6	Manning River	10 0		
Kapiti Island	9 0	6		Port Macquarie	8 56	4-5	
Manawatu River	10 0	8	6	Shoal Bay	8 30		
Wanganui River	10 15	8	6	Richmond River	9 20		
New Plymouth (Taranaki)	9 30	12	9	Cape Byron	9 45	6	
Kawhia Harbour	9 30	12		Tweed River (Danger Point)	9 45	5-8	
Aotea Harbour	10 0	12		Moreton Bay	9 30	3-7	
Waikato River	9 30	12	9	Wide Bay	9 0	6-8	
Manukau Harbour (entrance)	9 30	■	10	Sandy Cape	7 50	6-8	
Kaipara Harbour (entrance)	10 55	10	8	Port Curtis	9 40	10-12	
Hokianga River (entrance)	9 45	0		Byron Bay	9 45	6	
" (Kokohu)	10 15	10	7	Wreck Reef	8 45	6-8	
Cape Maria Van Diemen	8 0	7		Cato Bank	8 15	3½-5½	
Three Kings Islands	8 0	7		Lady Elliot Islet	9 0	7-8	
<i>North Island, East Coast.</i>				Heron Islet, Capricorn Group	9 0	10	
Cape Palliser	6 0	6		Keppel Bay	9 30	9-14	
Hawke Bay	7 50	3		Great Barrier Reef	8 48	7	
Pottery Bay	6 5	6		Saumarez Reef	8 0	■	
East Cape	8 55	7		Frederick Reef	8 0	6	
Hicks Bay	9 0	7		Kenn Reef	8 0	5½	
Tauranga Harbour	7 10	6	4½	Arvon Isles	8 30	5	
Mercury Bay	7 21	7	5	Chesterfield Islet	8 30	5	
Gt. Barrier Island (Nagle Cove)	6 25	10	7	Mellish Reef (Sand Cay)	7 55	5-6	
Auckland Harbour	7 5	11	9	Thirsty Sound	10 45	12-18	
Kawau Island	6 30	10	7	Port Bowen	9 35	■	
Waagari Harbour	7 0	9	7	Shoal Water Bay	10 30	12-18	
Tutakaka Harbour	7 0	9	7	Broad Sound	11 0	20-30	
Wangarara Harbour	7 10	9	7	Swain Reefs	10 0	■	
Bay of Islands (Moua Moe Islet)	7 15	9	6	Percy Isles, Middle Island (West Bay)	10 30	■	
Wangarua Harbour	8 15	7		" South Islet, (N.W. Bay)	10 30	14	
Cornwall Islands	8 0	7		West Hill	10 20	24	
				Cape Conway	11 0	18	
				Gould Island	6 45	6	
				Port Denison	9 30	6	
				Cape Upstart	11 0	6-8	
				Cleveland Bay	7 30	10-12	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.		
		Springs.	Neaps.			Springs.	Neaps.	
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>	
<i>Torres Strait.</i>				<i>Australia, West Coast.</i>				
Island -	9 28	6 - 10	II	Cockburn Sound -	9 0	1 - 1½	III	
by Island -	9 15	7 - 12		Warnboro' Sound -		3 - 4		
our River -	8 0	5 - 10		Koombanah Bay -	9 0	½ - 3		
Opening, } Barrier }	9 15	7 - 12		Port Grey, Swan } River -	9 0	1 - 1½		
Island -	9 15	7 - 10						
rs Group -	9 15	8 - 12		<i>Australia, South Coast.</i>				
Edmouth -	9 15	10	7	Corner Inlet -	11 40	■	6	
ork -	11 15	10		Wilson Promon- } tory -	2 0	III		
<i>Torres Strait.</i>				Port Western -	1 10	8		
Hardy Is. -	9 15	10		Port Philip, Entrance	1 30	3 - 4		
Island -	8 10	10		„ Capel Bay	2 30	3 - 4		
Island -	Irreg.	7	„ Hobson Bay	3 0	3 - 4			
Possession -	9 0	6	Melbourne -	1 20	3			
sion Island -	1 0	9½	Lady Bay -		4			
ry Island -	9 30	12	Geelong Harbour -	2 50	2½			
de Cay -	9 15	12	Port Fairy -		4			
y Islands -	9 30	10	Portland Bay -	Midnight	4			
hus Island -	12 15	10	Macdonnell Bay -	3 0	5			
y Islands -	12 15	10	Rivoli Bay -	10 0	4			
<i>Australia, North Coast.</i>				Port Elliot -		5 - 6		
our Strait, }	1 0	9½	14 - 20	Tronbridge Shoals	3 30	6		
Entrance - }				Port Adelaide -	5 44	6		
Island -	4 30	8		Cape Willoughby, }	4 10	6		
t River -	7 30	10 - 13		Kangaroo Id. - }				
ley Isles -	7 30	8 - 12		Pelican Lagoon, }	5 0	6		
Pellaw Isd.	7 30	4 - 7		Kangaroo Id. - }				
igator Road -	8 0	9		Spencer Gulf.				
as Bay -	8 0	6 - 8		Thorny Passage	12 0	6 - 8		
urn Isles -	6 0			Point Lowly -	7 0	6 - 8		
or River -	8 40	19 - 20		Port Augusta* -	8 30	9 - 12		
Bay -	6 0	18 - 25		Gambier Islands -	1 50	3		
ashington -	3 24	13		Port Eyre -	10 30	6		
aph Bay -	5 45	14		St. Francis Isle, }	12 0	6		
Bay -	12 0	21		Petrel Bay -				
Darwin -	5 30	17 - 24		Blancheport, }	1 0	5		
<i>Australia, North West Coast.</i>				Streaky Bay - }				
ta River, }	7 15	15 - 24	Smoky Bay -	12 15	6			
de Point - }			Denial Bay -	12 15	6			
Mosquito Flat	0 19	7 - 13	Fowlers Bay -	10 30	6			
Sandy Island	1 17	3 - 10	Venus Harbour -	2 15	6			
Frederick }	12 0	28	West Cape Howe -	9 0	6			
bour - }			Princess Royal }	11 56	1 - 4			
orge Basin -	12 15	26	Harbour - }					
ing Bay -	11 45	30	<i>Bass Strait.</i>					
alty Gulf -	12 0		Refuge Cove -	12 5				
rick Bay -	12 0	24	King Island -	1 0				
n Harbour -	12 0	37½	Hunter Island -	11 30	8			
Bay -	11 45	36	Three Hummock }	10 30	10			
Bay -	12 0	2-5	Island, E. side - }					
an Rocks -	11 30	2½	Swan Island -	9 35	6			
ion Bay -	9 10	I	Glennie Islands -	12 20				
			Kent Island -	11 10				
			Murray Pass -	11 10	8			

* Port Augusta, when the wind veers round to West and South and blows strong, the rise has been as much as 16 feet. Commander John Hutchison, R.N., Admiralty Survey, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Tasmania.				South America, Strait of Magellan.			
	h. m.	ft.	ft.		h. m.	ft.	ft.
Tamar R. George } Town - }	11 15	12½		Cape Virgin -	8 30	36 - 42	
" Launceston	1 0	12½		Cape Espiritu Santo	8 30	36 - 42	
Port Arthur -	7 52	4		Possession Bay -	9 0	36 - 42	
Hobarton -	8 0	4		Cape Orange -	3 0		
Macquarie Har- } bour - }	7 30	3		First Narrows -	9 0	36 - 42	
Circular Head -	13 0	9		Philip Bay, east side	9 30	24	
Cape Pillar -	1 0	6		Gregory Bay -	9 45	23	
Port Dalrymple -	12 5	10	7	Second Narrows -	10 0	23	
Eddystone Point -	9 39	7		Peckett Harbour -	12 0	6	
Islands in South Pacific.				Laredo Bay -	11 30	■	
Easter Island -	2 0			Santa Magdalena } Island - }	12 0	10	
Bow Island -	2 40	3		Port Famine -	13 0	6	
Tabuai Id. -		3		Cape San Isidro -	1 0	8	
Tahiti or Otaheite Id.	noon.	1½		St. Nicolas Bay -	2 6		
Resolution Bay, } Sta. Christina, }	2 30	4		Cape Froward -	1 0		
Marquesas - }				Port San Antonio -	12 0	7	
Fanning Id. -		4		Labyrinth Islands -	0 30	5½	
Tongatabu -	6 50	■		Port Gallant -	9 0	5½	
Port Resolution, } Tanna Island - }	5 35	3		York Road, } English Reach }	2 0	9	
Port Aneiteum, } Inyang - }	6 35	4		Bachelor River -	1 40	5	
Erronau or Futuna	7 24	4		Borja Bay -	1 50	6½	
Sandalwood Bay, } Fiji Islands - }	6 0	6?		Playa Parla Cove -	1 8		
Port Nukulan or } Rewa Road, }	6 47	5½		Port Tamar -	3 5	5	
Fiji Id. - }				Valentine Harbour	2 0		
Belade Harbour, } New Caledonia }	6 30	4?		Harbour of Mercy -	1 22	4	
Port de France, } New Caledonia }	8 25	4		Cape Pillar -	1 0		
Port St. Vincent, } New Caledonia }	5 50	4½		Smyth, Sarmiento, Wide, and Messier Channels.			
Woodlark Island }	7 15	4		Goods Bay -	0 30	7	
Louisiade Archip. }				Fortune Bay -	0 50	7	
Port Carteret, New }		6		Welcome Bay -	0 50	7½	
Ireland - }				Puerto Bueno -	1 40	8?	
Norfolk Island -	7 45	7		Guia Narrows -	2 10	■	
Campbell Island -	12 0	43?		Fury Cove -	1 15		
Islands in North Pacific.				Eden Harbour -	12 30	5	
Karakoa Bay, }	3 49			Halt Bay -	0 30	8	
Owyhee - }				Middle Island -	12 0		
Honoruru, Sand- }	4 0	2		Tierra del Fuego, S.W. Coast.			
wich Islands - }				Cape Horn -	4 40	9	
Pouinipet Island, }	6 0	4½		St. Francis Bay -	4 0		
Caroline Islands }				St. Martin Cove -	3 50	8	
Seypan Island, }	6 45	2½		Middle Cove -	3 30		
(Ladrone Ids.) - }				Goree Road -	4 0	8	
Pelew Islands -		6		Lennox Cove -	4 40	8	
				Nassau Bay -	4 0	6	
				Good Success Bay	4 3	6-8	
				Packsaddle Bay -	3 30	6	
				Orange Bay -	3 30	5	
				New-year Sound -	3 30		
				Adventure Cove -	3 10	4	
				March Harbour -	3 10	6	
				Doris Cove -	3 0	4	
				Stewart Harbour -	2 50	4	
				Townshend Harbour	2 30	5	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.		
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.	Central America, West Coast.			
Pisco Bay -	4 50	4		Nicoya Gulf (Port Herradura)	3 9	10	
Callao Bay -	5 47	4		Port Realejo -	3 6	11	
Huacho Bay -	4 45	3		Port la Union, } G. of Fonseca - }	3 15	10½	
Supé Bay -	4 50	3		Acajutla Road -	2 25	9	
Guarmey Bay -	6 10	2		Mexico, West Coast.			
Samanco or } Guambacho Bay }	6 30	2		Port Guatuleo -	1 30		
Port Malabrigo -	5 0	2		" Sacrificios -	3 15	6	
Lambayeque Road -	4 0	3		Acapulco -	3 6	1½	
Port Payta -	3 20	3		San Blas -	9 41	6½	
Malpelo Point -	4 0	10		Mazatlan -	9 40	7	
Ecuador.				Guaymas Harbour -	8 0	4	
Sta. Clara Island -	4 0	11		California and Oregon.			
Morro, Sandy Point of -	5 0	11		San Lucas Bay -	9 20	9½	
Puna Island -	6 0	11		Magdalene Bay -	7 35	6½	
Guayaquil -	7 0	11		Port San Quentin -	9 5	9	
St. Elena Bay -	1 18	8		Bartho-	9 10?	7-9?	
Salango Id. -	0 41	12		lomew -			
Port Manta -	3 4	6		Playa Marie Bay -	9 20?	7-9?	
Caracas River -	3 30	10		Cerro Island -	9 10	7-9	
Cape Pasado -	3 30	10		Sta. Barbara Island -	8 0	3½	
Atacames Bay -	3 37	13		San Diego Bay * -	9 38	5	
Santiago River -	3 30	13		San Juan Anchor-	9 40?	5	
Tumaca Road -	2 33	12		ago -			
Sanguiana (en-	4 10	9		San Pedro Bay * -	9 39	4½	
trance) - }				San Miguel, }	9 25	5	
Galapagos Islands.				(Cuyler Harb. *) }			
Charles Island -	2 10	6		San Rosa Island -	9 30?	5?	4
Albemarle " -	2 0	6		Santa Catalina Id. -	9 35?	5?	4
Chatham " -	2 23	6½		Santa Cruz Id. -	9 35?	5?	4
Indefatigable " -	1 56	6		San Luis Obispo * -	10 8	4½	
James, I., West-end -	3 10	5		Monterey* -	10 22	4½	
" N. side -	2 34	5		South Farallon* -	10 37	4½	
" Adam Cove -	2 14	5		San Francisco -			
Tower Id. -	?	?		" North Beach* -	12 6	4½	
Culpepper Id. -	?	?		Bodega Port* -	11 17	4½	
Wenman Isles -	2 10			Humboldt Bay* -	12 2	5½	
New Granada and Veragua.				Port Orford* -	11 26	6½	
Port Buenaventura }	4 0	13		Columbia River, }	0 15	7½	
(Negrilla Reef) }				Entrance - }			
" off the Town -	6 0	13		Astoria * -	0 42	7½	
San Juan River -	6 0	12		Nee-ab Harbour* -	12 33	7½	
Cabita Bay -	3 40	12		Port Townshend* -	3 49	5½	
Port Utria -	4 0	12		Fort Steilacoom* -	4 46	11	
Cupica Bay -	3 30	13		Vancouver Island and Juan de Fuca Strait			
Octavia Bay -	3 30	13		Esquimalt -	irr.†	7-10	5.
Pinas Bay -	3 15	14		Fane Island, }	irr.	12	
Chepo River -	3 40	16		Pumper Sound }			
Pedro Gonzales, }	3 50	16		Victoria -	irr.	7-10	
(Trapichu Id.) - }				Port Discovery -	2 30	7	
Chamé Bay -	4 0	16					
Saboga -	4 0	14					
Panama Road -	3 23	15-22	10-16				
Port Nuevo -	3 10	12					
Parida Island -	3 15	10½					

* From the U.S. Survey, the times of High Water being the Corrected and not the Vulgar Establishment
† May to October, from Midnight to 3 am. November to April from Noon to 3 pm.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.	<i>America, North West Coast.</i>			
ually, Puget } ound - }	6 0	18	15	Port Kuper -	h. m. 1 40	ft 13	ft. 10½
: Shucartie -	1 0	13½		Portland Inlet, }	1 8	16	
ver Harbour -	1 15	15½		(Salmon Cove) }			
Western }	1 0	13½		Sitka -	0 34	5-7	
trance - }		11		Behring Bay -	0 30	9	
α Bay -				Port Etches -	1 15	9½	
ahmoo Bay - }				„ Chalmers -	1 0	13½	
Drayton Har- }	2 0	12		„ Chatham -	1 0	12	
ur) - }				Ounalashka Island	7 30	7½	
er River (en- }	6 30	7-10		Cape Roshnoff -	7 30	15	
ance) - }				Good-news Bay -	6 15	13½	
ard Inlet, }	6 0	16		Golovnin Bay -	6 23	3½	
. of Georgia - }				Port Clarence -	4 25		
aimo Harbour }	5 0	14		Chamisso Island -	4 42		
. of Georgia - }							

T I M E

OF

HIGH WATER ON FULL AND CHANGE DAYS

AT THE PLACES GIVEN IN THE PRECEDING PAGES;

ARRANGED ALPHABETICALLY;

*With the Rise of the Tide at Springs and Neaps.**

(When a query, thus ?, is placed after the Time of High Water and the Rise, it indicates that what given are approximations.)

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Abaco, Bahamas - -	8 0	3		Aggerminde, Jutland -	4 9	2	
Abbey Head, England -	11 10	23	17½	Agnes, St., Scilly Isles -	4 30	16	
Abd-ul Kuri, Indian Ocean	8 30	6		Agoada Pnt., Hindoostan,	10 30	9	
Aberdeen, Scotland - -	1 0	12	10	W. Coast.			
Aberdovey, Wales - -	8 0	15		Agulhas Cape, Africa, S.	2 50	5	
Abervrach, France - -	4 14	22	16	Coast.			
Aberystwyth, Wales -	7 31	13½	10	Aix, Ile d', Charente R.,	3 20	17	
Abrolhos, Brazil -	4 48	6		France.			
Abtao I, Patagonia, W.C.	0 50	18		Akaroa Harb., New Zea-	3 24	8	
Abú-shehr, Persian Gulf	7 30	7		land.			
Acajutla, Central America	2 25	9		Akasi, Japan Sea -	6 36	6½?	
Acapulco, Mexico, W. Cst.	3 6	1¼		Akyab, Aracan R., Bay	9 45	9	
Acheen Head, Sumatra -	8 45	8		of Bengal.			
Achillbeg, Ireland - -	5 14	10¾	8	Al Bidá, Persian Gulf -	8 30?	6?	
Adams Port, (Sullivan	0 15	8		Alabat Harbour, Luzon -	10 0	9	
Bay) Yellow Sea.				Alan Island, Patagonia,	0 31	18	
——— (Mary Id.)	2 0	10		W. Coast.			
Yellow Sea.				Albany Id., Australia,	12 15	10	
Adelaide Port, Australia,	5 44	6		E. Coast.			
S. Coast.				Albemarle Id., Galapagos	2 0	6	
Aden, (Back Bay), Arabia,	9 30	8½		——— Port, Falkland	7 15	7	
S. E. Coast.				Islands.			
Adenara, Flores, Malay		8		Albert River, Australia,	7 30	10-13	
Archipelago.				N. Coast.			
Admiralty G., Australia,	12 0			Aldborough, England -	10 45	8?	
N.W. Coast.				Alderney, English Chan-	6 46	17	
Adolphus Id., Torres Strt.	12 15	10		Alexander Port, Africa,	3 0	5	
Adou Atoll, Maldives -	1 0	4		S.W. Coast.			
Adou Matte Atoll, Mal-	3 0	4		Algeçiras, Spain -	1 49	4	
dives.				Algoa B., Africa, S. Cst.	4 0	4-5	
Adventure Cove, Tierra	3 10	4		Alligator Rvr. Australia,	8 40	19-20	
del Fuego.				N. Coast.			
——— Port, New	12 20	8	6	Alloa, Firth of Forth,	3 18	17½	
Zealand.				Scotland.			
——— Sound, Falk-	5 30	5½		Altona, Germany - -	5 19	7	
land Islands.				Amboyna, Moluccas -	0 33	7	
Agadir, or Santa Cruz,	12 45	9		Ameland Gat, Netherlands	9 0	7	
Africa.				——— Holum Rd., „	11 30	7	

* By the Rise of the Tide is meant its vertical rise above the mean low-water level of Spring Tide.
See Diagram, page iv.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
ound, Nova Scotia	10 30	8	5	Appin Port, Scotland -	5 26	12½	8½
te Isles, (St. Joseph)	5 0	8½		Appledore, England -	5 28	23	16½
Indian Ocean.				Aquin Bay, St. Domingo	irr.	2-3?	
h, Wales -	10 30	18?	13?	Aracan R. (Bar), Bay of	9 45	9	6
(Inner Harbour),	12 0	16		Bengal, E. Coast.			
na, East Coast.				Aracati, Brazil -	6 0	8	6
nam B., Lombock -	8 0	6		Arish El, Africa, N. Cst.	1 30	9-12	
rdam, Indian O. -	11 0	3		Arasaig, Scotland -	5 50	13½	10
gawein, Persian G.	11 40	6		Arauco Bay, Chile -	10 13		
Strait, G. of Tartary	11 40	5-6		Arbroath, Scotland -	1 35	14	11
man Ids., Port Corn-	10 0	8½		Arcachon, France -	4 37	11½	9½
lia, Indian O.				Arcas Rks. G. of Mexico	noon	1½	
— Strt. Indian O.	10 24	9½		Ardglass, Ireland -	11 0	16	12
ava Bay, Madagas-	3 30	7		Ardrihaig, Loch Fyne -	11 53	9	7½
				Ardrossan, Scotland -	11 45	10	8
ea, San B., Patagonia,	0 45	5		Arenas Pt., San Carlos,	0 14	■	
. Coast.				Patagonia, W. Coast.			
rews, St., Bay, G.	irr.	1-2		Argyle, Bay of Fundy -	9 27	12½	10½
Mexico.				Arica Road, Peru -	8 0	5	
gada, Virgin Islands	9 0	1½		Arichat, Nova Scotia -	8 10	5	4
team, Inyang, S.	6 35	4		Arkhangel, White Sea -	7 28	2½	
acific.				Arklow, Ireland -	8 45	4	3
axa River, Africa,		13		Arnhem B., Australia, N.C.	8 0	6-8	
Coast.				Arroa, Malacca Strait -		10	
ra, Azores -	12 32	4½		Arthur Port, Tasmania -	7 52	4	
— Bank, Hindoo-	10 30	9		Arundel, England -	12 25		
a, W. Coast.				— (Bar) -	11 35		
— Pequena, Africa,	2 30	8		As Rocas, S. Atlantic -	5 15	10	
W. Coast.				Asaph St., B., Australia,	5 45	14	
a Pink B., Patagonia,	0 45	5		N. Coast.			
. Coast.				Ascension Id., S. Atlantic	5 30	2	
an Foot, England -	11 56	20	14	Askalg Port, Istay -	4 58	6½	4
apolis, United States	4 38	1	1	Astor, O. Oregon -	0 42	7½	6
, St. B., Cape Breton	8 34	6	4½	Atacames Bay, Ecuador	3 37	13	
lequann, United States	11 0	10½	9	Atchafalay Bay, G. of	irr.	2-2½	
, Bom Id., Africa	3 45	5		Mexico.			
osti Id., G. St. Law-				Athlone, Loch Seaforth -	6 16	15	10
nce, East Cape -	1 0	5	3	Atico Road, Peru -	8 53	■	
Bear Bay -	1 10	■	3	Auckland Harb., New Zea-	7 5	11	9
West Point -	2 0	6	4	land, N. Island.			
onish Harb. R. St.	9 0	■	2	Augustine St., U. States	8 21	5	4
wrence.				— St., B., Mada-	4 30	13	
gna Id., Carribbean		2		gascar, W. Coast.			
				Aux Cayes Bay, St.	irr.	2-3?	
agfl Bay (Port	4 0	5		Domingo.			
oiscol), Madagascar.				Avatela B., Kamchatka -	3 30	6½	4½
rio Cape St., Cuba		1½		Avon Isles, Australia, E.C.	8 30	5	
rio St. Port, Pata-	10 40	28		Avon River, Bigbury	5 47	16½	11½
nia, E. Coast.				Bay, England.			
— Ma-	12 0	7		Awajima (Inland Sea)	0 14	7	
lan Strait.				Japan.			
bus Id., G. St. Law-	10 30	■	3	Awanni R., New Zealand	7 44	■	
ce.				Axim, Africa, W. Coast-	4 30	4	
erp. Belgium -	4 25	15		Aylen Bay, Yellow Sea	2 40		
Pulo, Sumatra, N.E.		5		Aymaun, Persian Gulf -	11 20	6	
ast.				Ayr, Scotland -	11 50	8½	7½
Harb., New Zeal-	10 0	12		— Point of, I. of Man	11 7	20?	16?
schicola B., Gulf of		2½-4		Bab-el-Mandeb, G. of Aden	12 0	7	
xico.				Bachelor River, Magellan	1 40	5	
etetat B., Gulf St.	11 10	5?	3?	Strait.			
wrence.							

From observations made in the month of September by W. Stanton, Master Commanding U.M.
Surveying Brig Saracen.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	
Bacuit B., China Sea, E.C.	10 0	6		Barnstaple Bridge, Eng- land.	6 28	10½	
Badas Id., Linga Bay, Sumatra.*	6 0 PM	12		Barquero (entrance), Spain, N. Coast.	3 0	15	
Badong B. (S. Cst.), Baly	11 0	9½		Barracouta Harb., G. of Tartary.	10 0	3½	
Bagroo River, Sherbro River, Africa.			11	Barren Id., China Sea, E. Coast.	9 30	5½	
Bahia, Brazil - -	3 30	8		Barren Ids., Madagascar	4 45	12	
Bahreïn, Persian Gulf -	5 30	7		Barrow Harbour, New- foundland.	7 10?	5?	
Balabac Id., China Sea, E. Coast.	11 0	5		Barton Port, (Bubon Point), China Sea E.C.	10 55	6	
Balade Harb., New Cale- donia.	6 30	4?		Bas, Ile de, France -	4 49	23	
Balambangan Id., Borneo, N. Coast.	10 0	6-8		Básidúh, Persian Gulf -	12 0	10	
Balasore R., B. of Bengal, W. Coast.	10 0	15		Basque Port, Newfound- land.	8 55	5½	
Balbriggan, Ireland -	10 40	11		Basrah (Bar), Persian Gulf.	12 0		
Bald Head, United States	7 26	5	4½	—— Town - -	6 0?	9?	
Ballinacourty, Dungarvan, Ireland.	5 12	12½	9½	Bassein R., Bay of Bengal.	10 0	9	
Ballinskellig Bay, Ireland	3 40	12	7½	Batanes, Bashee Islands, China Sea, E. Coast.		4	
Ballycastle B., Ireland -	6 25	3	2	Batavia, Java - -	10 0	2	
Ballycottin, Ireland -	4 54	12	9½	Batchian, Gilolo, Moluccas	1 0	6	
Ballycrovane, Kenmare River, Ireland.	3 42	10½	7½	Bate (Gulf of Cutch), Hindoostan, W. Coast.	12 20	12	
Ballynakill Bay, Ireland, W. Coast.	4 40	12½	9½	Bathurst, G. St. Lawrence	3 15	7	
Ballyness (Bar), Ireland	5 22	11½	8½	Bathy Netherlands -	3 15	15	
Ballysadare (Quay), Ireland.	6 0	8½	5½	Batiscan, R. St. Lawrence	9 48	3½	
Ballyshannon (Bar) -	5 18	11½	8½	Batticalao River, Ceylon	5 0	2-3	
Ballyweel, Ireland -	5 23	12½	8	Bay of Harbours, Falk- land Islands.	6 0	5	
Balta, Scotland - -	9 45	6	4½	Bay of Islands, (Motu Mea Islet,) New Zealand.	7 15	9	
Baltimore, Ireland - -	4 23	10½	8½	Bay of Mercy, Banks Land		2	
—— United States	6 33	1½	1½	Bayonne (Bar), France -	3 45	12	
Banana Ids., Africa, W.C.	8 15	9		Bazaruto Cape, Africa, E.C.	4 15	10	
Bancoot R., (entrance) Hindoostan, W. Coast.	2 0	12		Beachy Head, England -	11 20	20	
Banda, Moluccas -	4 0	6?		Bear Cape, Prince Edward Island.	9 0	6	
Bander Alúleh, G. of Aden	6 45	6		Bear Head, C. Breton Id.	8 30	4½	
—— Gorí, Gulf of Aden	8 45			Beaubère Id., Gulf St. Lawrence.	6 30	6	
—— Sháab, Ind. Ocean	7 0	7		Beaufort, United States -	7 26	3½	
—— Feikam, Arabia, S.E. Coast.	10 0	8½		Beaumaris, Wales -	10 32	21½	
Banff, Scotland - -	0 28	10½	8	Beaver Harb., America, N.W. Coast.	1 15	15½	
Bantam, Java - -		5		—— (W. entrance) -	1 0	13½	
Bantry Harb., Ireland -	3 47	10	7½	—— Nova Scotia -	7 40	6½	
Barataria Bay, Gulf of Mexico.	irr.	1½		Bedeque Harbour, Prince Edward Island.	10 15	7	
Barbados, Caribbee Ids.	irr.	2		Bedford Bay, Tierra del Fuego.	0 30	7½	
Barbara Port, Patagonia, W. Coast.	12 28	6	4	Behring Bay, America, N.W. Cst.	0 30	9	
—— I. Santa, California	8 0	3½		Belfast, Ireland - -	10 43	9½	
Barbe St., Sumatra, N.E. Coast.	6 0	6		Belgrano Port, La Plata	6 0	12	
—— Sta. Id. California	8 0	3½		Bell Sound, Spitzbergen	8 56	3½	
Bardsey Id., Wales -	7 40	15		Belles Amour B., Labrador	9 0	4½	
Barfleur, France - -	8 51	17	13½	Belligam Bay, Ceylon -	2 20	2½	
Barmouth, Wales - -	7 41	17	13½				
Barnstable, United States	11 22	10	8½				
Barnstaple Bar, England	5 30	19	14				

* From observations made in the month of September by W. Stanton, Master Commanding H.M. Surveying Brig Saracen.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
aka Bay, Made.	4 30	16		Black Ball Harb., Ireland	3 40	9½	7½
W. Cst.				— Rock, Bay of Fundy	11 29	36	31
pe Pt., England	11 0	14	10½	Blacksod Bay (Quay), Ire-	4 47	10	8½
n, Sumatra -	6 0	3-5		land.			
e, Brazil -	3 0	5		Blair Harb., China Sea,	8 50	9	
, Africa, W. Cst.	2 30	5½		W. Cst.			
, Africa, S. Cst.	4 30	7		Blakeney, England -		9	
Castle, Cleddau	6 25	20	14½	— (Bar) "	6 30	15	
Wales.				Blanche Port, Streaky	1 0	5	
or Burburra	7 15	9		Bay, Australia, S. Coast.			
of Aden) Africa,				Blankenberg, Belgium -	12 48	13	11
				Blanco Cape, Africa, W. C.	11 46	6	
Guayana -	4 30	11½		Blas, San, Mexico, W. Cst.	9 41	6½	
Norway -	1 30	4		— La Plata -	2 0	11	10
Sound, Falkland	5 0	7		Blasket Islands, Ireland -	3 30	11½	8
				Blewfields, Mosquito Coast	1 50	2	
Irish Id., N.	7 14	4		Bligh Sound, New Zea-	10 45	8	6
ic.				land.			
Loch Roag,	6 11	11	8	Block Id., United States	7 36	3½	2½
Id.				Bluff Cay, Bahamas -	7 0	4½	
, I. of Harris,	6 11	13	9½	Bluff Harb., New Zealand	1 18	8	6
Id.				Blyth, England -	3 15	15	11
Point, Banks	6 30	12		— R., Southwold,	10 20	14	4½
				England.			
R., Gulf St.	3 0	12	7	Bodega Port, California	11 17	4½	3½
see				Bodkin Light, United	5 42	1½	1
Scotland -	2 18	15	11½	States.			
en Harb., G. St.	11 32	5	3	Bojador Cape, Africa -	12 0	8½	
see.				Bolt Head, England -	5 45	15½	11½
R. (entrance),	0 15	5		Bombay Dockyard, Hin-	11 40	12-17	
dan, W. Cst.				doostan, W. Coast.			
(Tooniang Id.,)	8 0			Bonacca Id., Bay of Hon-	9 0	1½	
E. Coast.				duras.			
Tsangchow Id.)	8 30			Bonanza, Spain -	2 0	12½	11
E. Coast.				Bonaw, Scotland -			
St. Lawrence	2 15	14	8½	Bonne Esperance Harb.,	9 15	5	2½
, B. of Bengal,	10 0	14		G. of St. Lawrence.			
			12	Bonny R. C., Africa, Wat.	5 0	9	
England -	6 7	16		Booby, Island, Australia,	4 30	11	
Islands, Arcas	10 10	11-14	9	N. Coast.			
, Africa, W. Cst.				Bordeaux, France -	6 50	14	12½
— Biano,	11 0	8		Borja B., Magellan Strait	1 50	6½	
W. Cst.				Borkum (Road) Germany	10 30	8-10	
Orango	10 0	11		Boscaw, England -	5 15	25	17½
, Africa, W. Cst.				Boston (Sluice), England	7 0	12	
ar), Spain -	3 0	13		— Deep (Clay Hole) "		21½	
own), " -	3 20	11		— Hob Hole " -		17	
. of Mexico -	irr.	2		— (Charlestown Naval	11 27	11½	10
, Sumbawa -	Noon.	11		Yard) United States.			
B. China Sea.	11 30	5		— Light, United States	11 12	11	9½
				Botany Bay, Australia, E.	8 15	7-8	
ance -	6 3	30	22½	Cst.			
, China Sea,	5 45	6		Boteler R., Madagascar -	4 30½	15½	
d, China Sea,	9 30	6		Boucatt, France -	3 39	8½	6
				Boughton Harb., Prince	8 40	5	2½
Africa, S. Cst.	4 0	4-5		Edward Island.			
Light, United	7 59	8½	4½	Boulogne, France -	11 25	25	19½
Point, Jutland	1 44	8		Bourbon Id., Indian Ocean, see Reunion Id.			
				Bouro (Cajeli Bay) Mo-	1 0	6	
				lucas.			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Ri
		Springs.	Neaps.			
	h. m.	ft.	ft.		h. m.	ft.
Bow Island, S. Pacific -	2 40	3		Bulama Island (Arcas Channel), Africa, W. Coast.	10 10	14
Bowen Port, Australia, E. Cst.	9 35	16		Bull Id., Newfoundland	7 22	3½
Bowling, R. Clyde, Scotland.	0 39	9		Bulls Id. Bay, United States	7 16	5½
Boyanna B., Madagascar, W. Cst.	4 30	15		Bulls Mouth (Achill Sound, N. entrance,) Ireland.	5 38	10½
Bradore Bay, Labrador -	8 45	4	2	Bulsaur R., Hindoostan, W. Cst.	1 45	18
Braha Harbour, Newfoundland.	7 0?	2-3?		Buluagan O'sta Ana Port, Filipinas.	12 0	5½
Bramble Cay, Torres Strt.	9 15	12		Buncranna, Ireland -	5 40	16
Brandy Pots, River St. Lawrence.	3 0	17	10	Bunessan, Scotland -	5 24	12
Brass River, Africa -	4 0	6		Burburra, see Berbereh.		
Brava, Africa, E. Cst. -	4 30	8		Burin Harbour, Newfoundland.	8 45	6½
Bray Head, Ireland -	10 45	12	9½	Burntisland, Firth of Forth, Scotland.	2 24	16½
Brazos River, G. of Mexico	irr.	1½		Burnt Isles, Kyles of Bute, Scotland.	11 50	10
Bréhat, France -	5 51	31	23½	Burong I., China Sea -	4 45	7
Brest, France -	3 47	19	13½	Burrard Inlet, Gulf of Georgia.	6 0	16
Bridgeport, United States	11 11	8	6½	Bushire, see Abú-shehr.		
Bridgewater (Bar) England	6 50	35	26½	Bussorah R. Bar, Persian Gulf.	12 0	
Bridlington, England -	4 39	16	12	Busuanga, Burias Island	12 30	6
Bridport, England -	6 5	11½	7½	Button Islands, Hudson Strait.	6 50	
Brielle, Netherlands -	3 0	5		Byron Bay, Australia, E. Coast.	9 45	6
Brighton, England -	11 15	19½	16	— Cape, Australia, E. Coast.	9 45	6
Bristol (King Road) England.	6 56	44	33	Cabita Bay, New Granada.	3 40	12
Britannia Bay, Sumbawa	1 0	11-12		Cacheo River, Africa, W. Coast.	7 45	8
British Sound, Madagascar, E. Cst.	4 0	9½		Cadiz, Spain -	1 45	9½
Broad Sound, Australia, E. Cst.	11 0	20-30		Caen, France -	10 57	
Broadhaven Har., Ireland.	5 0	10½	7½	Caermarthen (Bar) -	6 10	26
Broadway R. (entrance), China, E. Coast.	11 0	7½		Caernarvon, Wales -	9 33	13½
Broken Bay, Australia, E. Coast.	8 0	6-9		Caimites, St. Domingo -	8 0?	1?
Broom Loch (Ullapool)	6 40	14½	10½	Cairnlough, Ireland -	10 51	5½
Broughty Ferry, Scotland	2 22	14½	11	Cajeli Bay, Bouro -	1 0	6
Brouwershaven, Netherlands.	2 15	10	8	Calais, France -	11 49	19½
Bruit River, Borneo -	3 0	11		Calbuco Beach, Patagonia, W. Coast.	1 15	16
Bruni R., China Sea, E. Coast.	11 0	12		Calcasieu Fort, Patagonia, W. Coast.	1 18 0 47	18
Brunsbittel, Germany -	1 58	9		— River, Gulf of Mexico.		2½
Brunswick B., Australia, N.W. Cst.	12 0	24		Calcutta, Bengal -	2 30	
Brush, Yarmouth, England		5½	4½	Caldy Island, Bristol Channel.	6 0	24?
Bubon Point, Port Barton, China Sea, E. Coast.	10 55	6		Calebar R., Africa, W. Cst.	5 0	9
Buctouche River, G. St. Lawrence.	3 30?	4?	2½?	Caledonia Harbour, New Granada.	11 40	1½
Budehaven, England -	5 45	23	17	Calf Sound, Isle of Man-	11 17	16½
Buenaventura Port, Central America (Negrilla Reef).	4 0	13				
„ off the town -	6 0	13				
Buenos Ayres, S. America, E. Coast.	noon	irr.	irr.			
Buffalo R. (entrance), Africa, S. Cst.	3 45	4½				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Ncaps.			Springs.	Ncaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
oads, Hindoostan, east.	0 15	5		Carlisle Port, England -	12 10	20	14
ay, Peru -	5 47	4		Carlos, San, Port, Patagonia, W. Coast.	11 15	6	
Castle Pt.), Eng-	11 30	13	9½	— (Arenas Point) Patagonia W. Coast.	0 14	6	
, R. Tamar, Eng-	6 6	12½	8½	— (English Bank) Patagonia W. Coast.	0 4		
in, Babuyan, Is.	6 0	6		Carlos, San, Port, Falkland Islands.	7 0	8	
as Port, Spain -	3 0	15		Carouge River, R. St. Lawrence.	7 15	16	11
g. Banda Sea, noon		6		Carrigaholt, Ireland -	4 44	14	10½
Harb., Australia, Coast.	12 0	37½		Carsaig, Scotland -	5 28	10	7½
on R., Africa, W.	4 0?	6		Cartagena, New Granada	11 0	1½	1
ll Cape, New Zea-	6 0	8	6	Carteret, France - -	6 25	31	22½
—Island South ic.	12 0	43?		—Port, New Ireland.		6	
—Town, Gulf St. ence.	4 0	10	7	Cascumpeque H., Prince Edward Island.	5 40	3	2
lton, Scotland -	11 45	8½	6	Cashla Bay, Ireland -	4 33	16	12
he, Yucatan -	1 45	2½	2	Casquets, English Channel	6 45	15½	
ello (Welchpool), Fundy.	11 21	23½	20	Castlereagh Cape, Tierra del Fuego.	2 50	4	
, France - -	6 20	37	27	Castletown, Bearhaven, Ireland.	4 14	9¾	7½
Gut (Plaister), Nova Scotia.	9 10	4½	3	— Isle of Man -	11 10	20	16
Har., C. Breton Id.	7 48	6½	4½	Castletownsend, Ireland -	4 21	10¾	8
Cape, Africa -	10 0	10		Castries B., G. of Tartary	10 30	6	
River (entrance), L.	10 0	8		Castro, Patagonia, W. Cst.	0 11	18	
River } In Mar.	2 40	5½		Casuarina Point, China Sea, E. Coast.	9 30	6¾	
per Id.) } In May & June	1 40	5½		Catharina Sta. I., Brazil -	2 30	3	
(City) - -	2 40			Cato Bank, Australia, E.C.	8 15	3½-5½	
ast Castle, Africa, east.	4 30	6		Catoche Cape, Yucatan -	9 30	1	
ay Landing, U.S.	8 19	6	5	Cattawade Bridge, Stour River, England.	1 8	4½	
River, Ecuador -	3 30	10		Cavalli Ids., New Zealand	8 0	7	
tte Harbour, G. of Lawrence.	2 40	6	3	Cavern Island, China Sea, E. Coast.	9 30	5½	
Wales - -	6 59	38	29	Cawee Islands, Gulf St. Lawrence.	1 50	9	5
n, Wales - -	7 1	12	9	Cay West, United States — N.W. Channel, U.S.	9 30	1½	1½
— Bay, Prince rd Island.	8 40	5	3½	Cayenne, Guayana -	3 45	6	
ig Bay, Australia, Coast.	11 45	30		Cayeux, France - -	11 5	27½	21
pu, Patagonia, east.	0 50	10		Cedar Cays, United States	0 51	3¼	2½
s Garayos Shoals, Ocean.	2 0	4		Cedeira, Spain, N. Coast	3 0	15	
n, R. Tamar, nd.	5 47	14¾	10¾	Centre Id., (Foveaux St.) New Zealand.	12 15	8	6
Harbour, Nova L.	10 0	6	4	Ceram, Wahaay Harbour, Moluccas.	6 0	3	
Point, Gulf St. ence.	3 0	6	4	Cerros Id., California -	9 10	7-9	
ord (Bar or Cran-Point), Ireland.	11 0	14	11	Ceuta, Africa, N. Coast -	2 6	3¾	½
				Chacachacara Id., Trinidad, Caribbean Sea.	3 30	4	
				Chacao Bay, Patagonia, W. Coast.	0 40	14	
				— Narrows, Patagonia, W. Coast.	1 15	16	
				Chalky Inlet, New Zealand.	11 5	8	6

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	
Chalmers Port, America, N. W. Coast.	1 0	13½		Chittagong (Bar), Bay of Bengal, E. Coast.	1 15	15	
Chamé Bay, New Gra- nada.	4 0	16		Choiseul Port, Madagascar, E. Coast.	4 0	5	
Chamisso Id., America, N. W. Coast.	4 42			Chosan Harb. or Tsau- liang-hai, Japan Sea.	7 45	7	
Champion Bay, Australia W. Coast.	9 10	1		Christchurch, England -	{ 9 0 11 30 }	{ 5 }	
Champlain R., St. Law- rence.	9 45	3	2	Christianstæd, Santa Cruz.	7 30	¾	
Changchi Id., China, E.C.	9 30	17		Christmas Island, Indian Ocean.	10 0		
Changues Ids., Patagonia, W. Coast.	0 35			Christmas Harbour, Ker- guelen Id.	2 0	2	
Chapu Road, Hang-chu Bay, China, E. Coast.	12 0	25		Chuen-pee Point, Canton River.	2 0	7½	
Charles Cape, United States.	7 45	5		Chusan Archipelago, (Vernon Channel,) China, E. Coast.	9 40	14	
Charles Id., Galapagos -	2 10	6		— Tinghae, China, E. Coast.	11 0	12	
Charleston, United States	7 26	6	5	Circular Head, Tasmania	12 0	9	
Charlottetown, Prince Edward Island.	10 45	9½	7	Clam Point, B. of Fundy	8 27	8½	
Charlowka R., Lapland	8 8	12		Clara Sta., I., Ecuador -	4 0	11	
Chateau Bay, Labrador -	7 35	3½	1	Clare I., Ireland -	4 38	12½	
Chatham, England -	1 2	17½	14	Clarence Port, America, N.W. Coast	4 25		
— Id., Galapagos	2 23	6½		Clarence Harbour, Long Island, Bahamas.	8 30	4	
— Port, America, N. W. Coast.	1 0	12		Clarke Harbour, Bay of Fundy.	8 40	9½	
Chatte Cape, United States	12 0	13	8	Clear, Cape, Ireland -	4 0	9	
Chauan Bay, China, E. Coast.	11 0	6½		Clearwater Point, Gulf St. Lawrence.	11 30	5	
Chansey, Isles de, France	6 9	35	26	Cleveland Bay, Aus- tralia, E. Coast.	7 30	10	
Cheduba, Bay of Bengal-	11 30	8		Cley, England, N.E. Cst.		5½	
Chee-fow Harb., Yellow Sea, see Chifu.				Clifden Bay, Ireland, W. Coast.	4 30	13½	
Chentabun River, China Sea, W. Coast.	10 0	5½		Clinch Fort, Fernandina, } United States - }	7 53	6½	
Chepo River, New Gra- nada.	3 40	16		Clonakilty, Bay, Ireland	4 30	11	
Chepstow, England -	7 30	38	28½	Coacocho Bay, G. of St. Lawrence.	10 30	5	
Cherbaniani Reef, Lacc- dives, Indian Ocean.	10 0	7	4	Cobija Bay, Bolivia -	9 54	4	
Cherbourg, France -	7 49	17	12¾	Cocagne River, G. St. Lawrence.	7 30?	4?	
Chesilton, England -	6 13	10½	7	Cochin Harb. and Road, Hindoostan, W. Coast.	1 0	3½	
Chester, England -	10 30	26		Cockburn Port, Africa, E. Coast.	4 15	12	
Chester River (Rockhall Creek), United States.	5 23	2½	1	Cockburn Sound, Aus- tralia, W. Coast.	9 0	1-1½	
Chesterfield Islet, Aus- tralia, E. Coast.	8 30	5		Cockenzie, Firth of Forth, Scotland.	2 16	15½	
Chetican, C. Breton Id. -	8 15	3½		Cod Cape, United States	11 30	13	
Chichester, England -	11 30			Codroy Island, New- foundland.	9 15	6	
Chifu, Yellow Sea -	10 0	8	6½	Colorado River, La Plata	4 0	9	
Chimmo Bay, China, E. Coast.	10 20	16		Colarados, R. La Plata -	3 40	11	
Chimney Id., Rees Pass, China, E. Coast.	11 30	12					
Chinchew Harb., China, E. Coast.	12 25	17					
Chin-hae, Yung R., China, E. Coast.	11 20	12½					
Chipiona, Spain -	1 34	12½	8				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs	Neaps.			Springs	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Spring Inlet, United States	7 32	5½	4½	Cranford Bay, Mulroy Bay, Ireland	8 3	4	
ine, Ireland	6 24	6½	4	Crapaud, Prince Edward Island	10 0	8	6
Bay, Australia, W. Coast	11 45	36		Crimon Ids., Java Sea	8 0	■	5
Point, Colne River, land.	12 0	14	10	Criman, Scotland	4 49	6-8	4-5
Billia Cay, Pearl Sea, Caribbean Sea	2 0	2		Croc Harbour, Newfoundland	6 30?	4?	
bo, Ceylon	1 0	2		Cromarty, Scotland	11 56	14	11
bia River, (entr.)	0 15	7½		Cromer, England	7 0	14½	11
erica, N.W. Coast				Crow Harb., Nova Scotia	8 0	6½	4½
o Islands, (John I.) Indian Ocean	3 30	8½		Crooked Id., Bahamas	7 0	2½	
o Islands, (May-L.), Indian Ocean	4 10	11½		Crookhaven, Ireland	4 9	9½	■
mes River, Africa, Coast	10 0	15	11½	Cucac Bay, Patagonia, W. Coast	12 0	6	
Inlet, Patagonia, Coast	1 10	17	13½	Cuckolds Point, River Thames, England	1 45	19?	15?
nean, France	3 12	13	9½	Culdaff Bay, Ireland, W. Coast	5 53	8½	6
v, Cochin China	3 0	4		Culebra or Passage Id., Caribbean Sea	9 0	1	
River, Africa	4 30	6		Cullin Id., Patagonia, W. Coast		20	
m Bay, Persian G.	7 45	9½		Culpepper Id., Galapagos	■	?	
Spain	1 18	11½	7½	Cumberland Basin, (Sackville) Bay of Fundy	11 55	45½	38
rd Road, France	3 46	21	15	Cupchi Point, China, E. C.	8 0		
ncion Cove, Bolivia	10 0	4		Cupica Bay, New Granada	3 30	13	
y Cape, Australia, east	11 0	18		Curieuse, Seychelles, Indian Ocean	5 10	7	
arb. Newfoundland	7 25			Curtis Port, Australia, E. Coast	9 40	10-12	
Port, New land	3 50	7½	5½	Cuttyhunk, United States	7 40	4½	3½
, Chile	8 30	5		Cutwell Harbour, Newfoundland	7 0?	2-4?	
Road, England	3 0	14½	11	Cuxhaven, Germany	1 8	10	
bo Bay, Chile	9 8	5		Cuyler Harb., California	9 25	5	4
an Ithae., France	3 37	13½	10½	Dagga Sound, New Zealand	11 30	8	6
m River, Guayana	5 10	8½	6	Dahouet, France	6 5	32	23½
Bay, Bay of al, W. Coast	9 10	4-5	3	Dalawan Bay, China Sea, E. Coast	11 0	5	
R. (Bar), Bay ngal, W. Coast	9 0	■		Dalcabue, Patagonia, W. Coast	0 26		
Bay (Elobey), Africa, W. Cst.	5 0	7		Dalhousie Harb., G. St. Lawrence	3 10	9	
(Penrose Quay), Id.	4 58	12½	10	Dalkey Island, Ireland	10 45	13	11
la., B. of Honduras	1 45	2		Dalrymple B., Madagascar W. Coast	5 0	15	
Inlet, S. Australia	11 40	8		— Prt., Tasmania	12 5	10	7
Il, Cape, England	4 35	18?	13?	Damaun Bar, Hindostan, W. Coast	1 30	17	
a, Spain	3 0	15		Dampier Strait, Moluccas		11	
Id. (Prairie Bay), Lawrence	4 25	17	10	Danno R., Hindoostan, W. Coast	1 30	17	
illes, France	9 7	20	15½	Darnley Id., Torres Strait	9 30	12	
escherry, Ireland	4 36	10½	8½	Dartmouth, England	6 16	14	10
sk, England	4 35	14½	11½	Darwin H., Choiseul Id., Falkland Islands	6 30	5½	
(West), England	{ 10 45 11 45 }	{ 12½ 12½ }	{ 9½ 9½ }				
st, Patagonia, E. C.	9 30	40					
l River, Chile	0 52	21					
l, B. of Honduras	8 30	1½					
land, River St. ence.	5 24	17	■				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neap.			Spring.	Neap.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Darwin Port, Australia, N. Coast.	5 30	17-24		Donaghadee, Ireland -	11 13	11½	9
Dauphin Fort, Madagascar	4 30	7		Donegal Harb., Ireland -	5 18	11½	9½
De Roompot, North Sea	12 30	12	8	Doris Cove, Tierra del Fuego.	3 0	4	
Deal, England -	11 15	16	12½	Dornock Road, Scotland	11 47	11	
Deep Point, Durian Strait	5 0	10		Douglas, Isle of Man -	11 12	20½	16
Deer Sound, Orkneys -	10 30	10	7½	—— Road, Bahamas -	8 30	4	2½
Delagoa Bay (Port Melville), Africa, S. Coast.	4 30	15		Dover, England -	11 12	18½	15
(Portuguese Factory), Africa, S. Coast.	5 20	12		Downham Reach, Orwell, England.	12 27	12	
—— Shefeen Id., Africa, S. Coast.	4 40	12		Dragons Mouth, Caribbean Sea.	3 0	4	
Delaware (Brenkwater), United States.	8 0	4½	3½	Drayton Harb., St. Juan de Fuca Strait.	2 0	12	
Delftzyll, Germany -	11 15	8-10		Drogheda (Bar), Ireland	11 0	11½	9
Delgado C., Africa, E. C.	4 0	16	11½	Duart, Isle of Mull -	5 0	12	10
Delhi River, Sumatra -	4 0	8		Dublin (Bar), Ireland -	11 12	12-14	9-1
Demerara R., Guayana -	4 45	9	6	Dumbarton, Scotland -	0 20	9	
Denial Bay, Australia, S. Coast.	12 15	6		Dunbar, Scotland	2 8	14½	11
Denison Port, Australia, E. Coast.	9 30	6		—— Hindoostan, W. Coast.	10 10	8	
Desire Port, Patagonia, E. Coast.	12 10	18½		Dunbeacon, Ireland -	3 51	10½	7
Devonport Dockyard, England.	5 43	15½	11½	Duncansby Ness, Scotland.	10 14	10	7
Dewghur Harbour, Hindoostan, W. Coast.	11 25	9		Dundalk, Ireland -	10 56	13½	11
Diamond Island, Bay of Bengal.	10 30	8		Dundee, Scotland -	2 32	14½	11
—— Point, Malacca Strait.	12 0	9½		Dungeness, England -	10 45	21½	19
Diego, San, Bay, California.	9 38	5	3½	Dunk Island, Australia, E. Coast.	9 28	6-10	
Diego, San, Cape, Tierra del Fuego.	4 30	10		Dunkerque, France -	12 8	16½	13
—— Garcia Island, Indian Ocean.	1 30	6		Dunkerron, Kenmare R., Ireland.	3 45	10½	8
—— Ramirez Ids., Tierra del Fuego.	4 0	6		Dunmanus Harb., Ireland	3 57	9½	7
Dielette, France -	6 40	27	20½	Dunmore, Ireland -	5 27	12½	9
Dieppe, France -	11 6	27	20½	Durnford Port, Africa, E. Coast.	4 45	12	
Digby Gut, B. of Fundy	11 0	27½	23	Dusky Bay, New Zealand	11 15	10	8
Dingle, Ireland -	3 51	10½	7½	Dvina (Bar), White Sea		3½	
Discovery Port, America, N. W. Coast.	2 30	7		Dyer Id., Africa, S. Cst.	2 50	5	
Dislocation Harb., Tierra del Fuego.	1 40	■		Easdale Sound, Scotland	5 10	10-12	
Diu Island, Hindoostan, W. Coast.	2 0	■		Easter Id., South Pacific	2 0		
Dives, France -	9 39	21	16	East Cape, New Zealand	8 55	7	
Divy Pt., Bay of Bengal		5		—— Point, Prince Edward Island.	8 30	■	1
Doboy Lighthouse, U. S.	7 33	7½	7	Eccehona, France -	6 32	31	2
Dodandowe Bay, Ceylon	1 50	1½		Eddystone Pt., Australia, E. Coast.	9 39	7	
Dodo River, Bight of Benin.	4 17	5		Eden Harbour, Patagonia, W. Coast.	12 30	5	
Domingo, San, Port, Patagonia, W. Coast.	12 0	7		Edgar Port, Falkland Is.	7 15	6	
				Edgartown, United States	12 16	2½	
				Edina, Africa, W. Coast	5 50	4	
				Edmonstone, Id., Sherbro River Africa.			
				Egg Id. Lt., United States	9 4	7	
				—— G. St. Lawrence	2 0	11	
				Egmont Bay, Prince Edward Island.	3 0	4	
				—— Port, Falkland Islands.	7 30	■	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
ord, Faeroe Ida.	11 0	9½	7½	Famine Port, Magellan Strait.	12 0	6	
trance, Germany	12 0	11		Fane Id., Plumper Sound, Oregon.	irr.	12	
ita., Port, Pata-	4 0	17		Fannings Id., S. Pacific -		11	
E. Coast.				Fanny Hole, Mulroy Bay, Ireland.	6 17	9½	8
Bay, Ecuador -	1 18	8		Fansiak Channel, Canton R., China, E. Coast	1 0	7½	5
h Bay, Africa, Coast.		5-6		Farallon, South, California	10 37	4½	3½
ort, Islay -	5 0	5	4	Fareham (close to the Upper Quay), England.	11 48	11½	8½
ode Anchorage, of Fundy	9 54	13	10½	Bridge, Eng-	11 51	7½	4½
ort, Australia, S.C.		5-6		land.			
Germany -	12 0			Farewell, Cape, New Zealand.	9 20	14	10
ver, (outer buoy), many.	10 0	8-10		Fatsizio, Japan Sea -	6 0	5	
ter Rock, Yellow	10 30	10		Fayal, Azores, Atlantic Ocean.	11 45	4	
our R., Australia, east.	8 0	5-10		Fear, Cape, River, United States.	7 19	5½	4½
— Strait, Aus-	1 0	9½		Fécamp, France -	10 44	23½	18
. N. Coast.				Fenit, Tralee Bay, Ireland	4 3	12½	9½
to Harbour, Japan	5 30	6		Feolin Ferry, Jura -	4 41	6½	4½
Bank, San Carlos,	0 4			Fernandina, Clinch Fort, United States.	7 53	6½	6½
ronia, W. Coast.				Fernando Noronha Island, S. Atlantic.	4 0	6	
Harbour, Antigua		2		Fernando Po, Bight of Biafra.	4 0	7	
R., Delagoa Bay,	7 30	5		Ferro, Canary Ida. -	12 30?	9?	
a, S. Coast.				Ferrol, Spain -	3 0	■	
Bay, Japan Sea -		4		Filey Bay, England -	4 20	16	12½
Bay, (Palawan)	10 10	6½		Finisterre, Cape, Spain -	3 0		
a Sea, E. Coast.				Fish Hd., G. Manan, Bay of Fundy.	11 16	22½	18½
Bay, Barrow Str.	12 6	8		Fishguard, Wales -	6 56	11½	8½
River, Bigbury England.	5 40	16½	11½	Fitz-Roy Id., Australia, E. Coast.	9 15	7-12	
France -	5 59	33½	24½	Fitzroy Port, Falkland I.	4 45	6	
m or Futuna, S. fic.	7 24	4		Flamand Bay, St. Domingo	irr.	2-3?	
enac, Pt., Gulf St. rence.	4 10	4	2½	Flamborough Hd., England	4 30	16	12
n Santo, C., Ma-	8 30	36-42		Flamenco Port, Chile -	9 10	5	
n Strait.				Flatholm Ids., Bristol Channel.	6 54	37?	28?
nalt, St. Juan de a Strait.*	irr.	7-10	5-8	Fleetwood Port, England	11 12	26½	19½
ton Port, Australia, Coast.	3 24	13		Wyre Light -	11 11	27	20½
m, San, Port, Pata-	0 15	5		Flesh Bay, or Bay St. Bras, Africa, S. Coast.	3 30?	6?	
ia, W. Coast.				Fleur-de lis Harb., New-	7 0?	2-4?	
Port, America, V. Coast.	1 15	9½		foundland.			
elists, Patagonia, Coast.	1 0	5		Flinders Group, Australia, E. Coast.	9 15	8-12	
nth, England -	6 21	12½	8½	Florida Cape, United States.	8 34	1½	1½
n, Bahamas -	7 20	2½		Flushing, Belgium -	1 20	15	
outh, Scotland -	2 15	15?	11?	Fog Ids., Hang-chu B., China, E. Coast.	11 45	17	
Port, Australia S. C.	10 30	6		Fogo Id., Newfoundland	7 20	4	
ale, Shetlands -	11 0	5	3½	Folkstone, England -	11 7	20	16½
Port, Australia, S.C.		4					
nd Sound (N. en-	6 45						
oe), Falkland Ida.							
— (S. entrance)	7 0						
ash, England -	4 57	16	11				
Point, Bay of Bengal, Coast.	8 0	8					

* May to October from Midnight to 3 am. November to April from Noon to 3 pm.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Folly Point, Petitcoudiac River, B. of Fundy.	11 49	45	38	Gambia R., Africa, W.C.	8 10	6-9	
Fongwhang Group (Bullock Harb.) China W.C.	8 30	17		Gambier Ids., Australia, S. Coast.	1 50	3	
Forçados River, Bight of Benin.	4 22	5		Garroch Head - -	11 49	10	
Forecarreah R., Africa, W.C.	7 40	11		Gaspé Basin, Gulf St. Lawrence.	2 40	5	
Formby Point, England -	10 35	28		Gay Head, United States	7 37	7	
Formoza Mt., Malacca Strt.	8 0	11	8½	Geby, Fohou Id., Gilolo Passage, Moluccas.		5	
Fort Dauphin, St. Domingo	7 0	5½	3½	Geelong Harbour, Australia, S. Coast.	2 50	2½	
Fortune Bay, Patagonia, W. Coast.	0 50	7		George Cape, Nova Scotia	9 15	4	
Foulness, Crouch River, England.	12 5	14½	10½	George d'Elmina, St. Africa, W. Coast.	4 30	6	
Fowey, England - -	5 14	15	11½	—— Port, B. of Fundy	11 17	32	23
Fowlers B., Australia, S.C.	10 30	6		—— St., Basin, Australia, N. W. Coast.	12 15	25	
Fox Bay, Falkland Ids. -	7 0	6		—— Shoals, United States.	10 30	7	
Foyle Lough (Warrenpoint), Ireland.	6 20	6½	5	Georges, St., Sound, G. of Mexico, Mid entrance.	1 31	1½	
Foynes Island, Ireland -	5 35	15½	12	—— West entrance	irr.	2½-4	
France, Port de, New Caledonia.	8 25	4		Georgetown, United States	8 40	4½	
Francis, St., Bay, Tierra del Fuego.	4 0			—— South Island, United States.	7 56	4½	
Francisco, San (North Beach), California.	12 6	4½	3½	Geriah Harbour, Hindoostan, W. Coast.	2 40	9	
Fraser River (entrance), Columbia.	6 30	7-10		Germain St., France -	6 20	34	25
Fraserburgh, Scotland -	0 40	11	8½	Ghubbet Ne, Socotra, Indian Ocean.	7 0	7	
Frechette Id., River St. Lawrence.	8 0	14	9	—— Hashish, Arabia, S.E. Coast.	10 0	10	
Frederick Reef, Australia, E. Coast.	8 0	6		Gibraltar, Spain - -	2 20	3½	
Frederickshaab, Greenland.	6 3	12½	9½	Gigha Sound, Scotland -	2 22	4	
Friederichstadt, Denmark	2 37	9		Gijon Bay, Spain, N. Cst.	3 15	15	
Frio Porto, Brazil -	2 40	4½		Gilmorris Id., Africa, W. Coast.	6 0	11	
Froward Cape, Magellan Strait.	1 0			Gizree Bunder, Indus, Hindoostan, W. Coast.	9 50	7	
Fugloe Fiord, Faroe Ids.	11 15	6½	4½	Glasgow, Scotland - -	1 25	9	
Funchal Bay, Madeira -	12 48	7		—— Port, Scotland -	0 18	9	
Funk Id., Newfoundland	7 0?	2-3?		Glenan Iles, France -	3 12	13	10
Fury Cove, Patagonia, W.C.	1 15			Glennie Ids., Bass Strait	12 20		
—— Harbour, Tierra del Fuego.	2 30	4		Gloucester Cape, Tierra del Fuego.	1 30	5	
Fury Id., Tierra del Fuego	2 30	4		—— Harbour, United States.	11 4	10½	
Fury and Hecla Strait, Arctic Regions.	7 0	8		Gluckstadt, Germany -	3 9	10	
Gaboon R., Africa, W.C.	5 30	3		Goa, Hindoostan, W.C. -	11 30	6	
Galang Bay, Hainan Id., China Sea.		4-5		Godbout River, Gulf St. Lawrence.	1 52	11	
Gallant Port, Magellan Strait.	9 0	5½		Goeree (West Gat) -	1 45	7	
Galle, Pointe de, Ceylon, S. Coast.	2 0	2		Gollonsir Socotra, Ind. Ocean.	7 20	8	
Gallegos Port, Patagonia, E. Coast.	8 50	46		Golovnin Bay, America, N. W. Coast.	6 23	3½	
Gallinas R., Africa, W. C.	6 45	4		Gomera, Canary Ids. -	12 45?	9?	
Galloway (Mull of) -	11 15	15?	12?	Gometra, Loch Tuadh, I. of Mull.	5 29	11½	
Galway, Ireland - -	4 35	14½	11	Gonaives Bay, St. Domingo	8 0	1	
Galveston, G. of Mexico		1½	½				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Bay, Patagonia, W. st.	0 30	7		Grenadines, Caribbee Ids.	3 0	1½	
Hope, Cape of, na, E. Coast.	9 0			Grey Port, Swan River, Australia, W. Coast.	9 0	1-1½	
News B., America, W. Coast.	6 15	13½		Greytown, Mosquito Cat.	9 0	1½	
Success Bay, Tierra Fuego.	4 3	6-8		Gribanika Pt. White Sea	4 50	■	
ym Creek (entrance), Hindoostan, W. Coast.	11 0	9		Griffith I., Barrow Strait	12 15	3½	2½
Cove, Newfoundland.	7 0?	2-3?		Griguet Bays, Newfoundland.	7 0?	2-3?	
Sound, Virgin Ids.	8 30	1½		Grimsby, England	5 36	19½	15
Port, New Zealand	9 0	8	6	Grindstone Island, Bay of Fundy.	11 47	41	34½
Road, Tierra del Fogo.	4 0	8		Grismez Cape, France	11 27	21½	16½
rn Ids., Australia, Coast.	6 0			Grondine, R. St. Lawrence	9 0	9	6
Island, Australia, Coast.	6 45	6		Guambacho Bay, Peru	6 30	2	
y, France	7 6	22	17½	Guarmey Bay, Peru	6 10	2	
na, Cape, Harbour, y of Honduras.	10 30	2		Guatuleo, Mexico, W. C.	1 30	5	
d Cestos, Africa, Coast.	5 20	4		Guayaquil, Ecuador	7 0	11	
-Harb., Gd. Manan, y of Fundy.	11 7	21	17½	Guaymas, Mexico, W. C.	8 0	4	
- Lahou, Africa, Coast.	4 20	4		Guernsey, (St. Peter Port,) English Channel.	6 37	26	16½
d Passage, B. of ndy.	10 43	20½	17	Guia Narrows, Patagonia, W. Coast.	2 10		
d Port, Mauritius	1 0	1½		Guinchos Kay, Bahamas	7 40	3	
- Rustico, Prince ward Island.	6 40	4	2	Gun Cay, Bahamas	8 30	3	
de-digue, Madame I., pe Breton Id.	7 55	6½	4½	Gundavee R. (entrance), Hindoostan, W. Coast.	2 0	19	
de Point, Chile	9 45			Gunfleet Sand, England	11 40	12	8
ton Pier, Scotland	2 20	16	12½	Gutzlaff Id., China, E. C.	11 30	15	
ville, France	6 13	37	27½	Guysborough, Nova Scotia.	8 20	6½	4½
elines, France	12 0	19	15	Gweedore (Bunbeg), Ireland.	5 32	11	8
send, England	1 10	17½	14	Haarlem, Netherlands	9 0		
t Barrier, Id. (Nagle ve), New Zealand.	6 25	10	7	Habitable Id., Lapland	7 9	9	
t Barrier Reef, Australia, E. Coast.	8 48	7		Habitants Harb., C. Breton, Id.	8 20	6½	4½
t Fish Bay, Africa, Coast.	2 30	5-6?		Haimun Bay, China, E. Coast.	9 0		
t St. Lawrence sb., Newfoundland.	8 30	7	4	Haiti Cape, St. Domingo	6 0	3	
man Bay, Ireland	4 39	15½	11½	Hai-yun tau, (Thornton Haven), Yellow Sea.	9 0	12	
n Island, River, St. wrence.	2 45	16	9½	Hakluyt Head, Nova Zembla.	1 30	4	
castle Point, Ireland.	11 2	14	11½	Hakodadi Harb., Yezo Island, Japan.	5 0	3	
rock, Scotland	12 8	9½	8½	Halifax, Nova Scotia	7 49	6	5
rich, England	1 43	19	15	Halt Bay, Patagonia, W. Coast.	0 30	8	
ry Bay, Magellan sit.	9 45	23		Hamburg, Germany	5 29	6½	
da (St. George rb.), Caribbee Ids.	2 40	1½	2	Hamilton Port (Korea), Yellow Sea.	8 30	11	
				Hammerfest, Norway	1 10	9	
				Hammond Knoll, England, E. Coast.	7 40		
				Hang-chu Bay (Sesham Ids.), China, E. Coast.	11 45	14	
				—(Fog Ids.)	11 45	17	
				—(Chapoo Rd.)	12 0	25	
				—off Can-pu		32	
				Hanover Sound, Bahamas	8 15	4	■

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Ncaps.			Springs.	Ncaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Harbour of Mercy, Magellan Strait.	1 22	4		Hillsborough Bay, Prince Edward Id.	10 45	9½	
Harbour Grace, Newfoundland.	7 30?	7?		——— Island (New Port), Bonin Islands.	11 32	3½	
Harbour Id., Nova Scotia	7 40	6½	4½	Hillswick Firth, Shetland	9 45	6½	
Hardy Port, New Zealand	9 55	8	6	Hilton Head, United States	7 19	7½	
Harrington Port, England	11 5	26	19	Hirtshals, Jutland -	4 28	1	
Hartlepool, England -	3 28	15	11½	Hobarton, Tasmania -	8 0	4	
Harwich, England -	12 6	11½	9½	Hoe-e-tow Bay, China, E. Coast.	12 15	16	
Hastings, England ..	10 53	24	17½	Hokianga R. (entrance), New Zealand.	9 45	10	
——— Harbour, Bay of Bengal, E. Coast.	10 40	13½		Hokianga R. (Kokohu) New Zealand.	10 15	10	
Hatteras Inlet, United S.	7 4	2½	2	Hollesley, England -	11 30	8?	
Haute Isle, Bay of Fundy	11 21	33	28½	Holmes Hole, United States.	11 43	1½	
Havana, Cuba - -		3		Holsteinborg, Greenland	6 30	10	
Haverfordwest, Wales -	6 42	7½	2½	Holy Island, England -	2 30	15	
Håvre, France - -	9 51	22	18	Holyhead, Wales -	10 11	16	
Hawke B., New Zealand	7 50	3		Hon-cohe Bay, China Sea, W. Coast.	11 30	5	
Héaux Lights, France -	5 45	31	23½	Hondenklip Bay, Africa, S.W. Coast.	2 30	5½	
Heawandou Pholo Atoll, Maldives.	9 30	5		Honfleur, France -	9 29	23½	
Heda Bay, Japan Sea -		5½		Honghai B., China, E. C.	10 0	6½	
Helena St., Bay, Africa, W. Coast.	2 30			Honoruru, Sandwich Ids.	4 0	2	
——— Id., S. Atlantic	3 11	3		Hooetow B. China, E. Cst.	12 15	16	
——— St. Sound, U.S.	7 8	7½	6	Houk Kong, China, E. C.	10 15	4½	
Helgoland, German Ocean	11 33	9½	7	Hoogly R., (W. entrance), Bay of Bengal, W. C.	10 0	10½	
Helier, St., Jersey, English Channel.	6 25	30½	21½	Hope Harb., Falkland Ids.	8 10	7	
Hell Gate Approaches, United States.				Horn Cape, Tierra del Fuego.	4 40	9	
——— Long Id., (Blackwells Dock).	9 59	6	5½	Horn or Blaavand Point, Jutland.	1 44	5	
——— N. of Astoria Ferry.	9 48	6½	5½	Horton Bluff, B. of Fundy	12 30	48	
——— Pot Cove, (S.E. part).	10 48	8½	6½	Hougue La, France -	8 42	18½	
——— Wards Id., (Paupers Dock).	10 9	6½	5	Hourdel, France -	11 26	27½	
Hellevoetsluis, Netherlands.	2 30	8	6	Hout B., Africa, W. Cst.	2 20	5	
Henlopen Cape, United States.	8 0	4½		Houtman Rocks, Australia, N.W. Coast.	11 30	2½	
Henry Cape, United States	7 40	4		Howden, R. Tyne, England.		12	
Henry Port, Patagonia, W. Coast.	12 0	5		Howe, West Cape, Australia, S. Coast.	9 0	6	
Heron Islet, Capricorn Group, Australia, E. C.	9 0	10		Howth Harbour, Ireland	11 9	13	
Herradura Port, Chile -	9 8	5		Huacho Bay, Peru -	4 45	3	
——— Nicoya Gulf -	3 9	10		Huafu Islands Patagonia, W. Coast.	12 0	7	
Hewett Bay, Tierra del Fuego.	0 30	6½		Huapilinao Hd., Patagonia, W. Coast.	1 25	15½	
Heybridge, Blackwater, River, England.	12 20	12	8	Huasco Port, Chile -	8 30	6	
Hie-chechin Bay, China, E. Coast.	7 0			Huildad Inlet, Patagonia, W. Coast.	0 48	16-20	
Hicks Bay, New Zealand	9 0	7		Hukkar R. (entrance), Hindoostan, W. Coast.	10 30	11	
Hierting, Jutland -	2 45	5		Hull, England - -	6 29	20½	
Higbees, Cape May, United States.	8 33	6½	5½	——— Bridge, Crouch R., England.	12 25	16	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
B., Yellow Sea	2 30	8		James Id., W. end, Galapagos.	3 10	5	
Bay, California	12 2	5½	4½	— R. (City Point) U.S.	2 11	3	2¾
L., Bass Strait -	11 30	8		Jask Cape, Persian Gulf	6 0	6	
rt, Australia, E.	9 45	6-7		Jebogue, Bay of Fundy-	10 4	15	11½
				Jedore, Nova Scotia -	7 45	6½	4½
umber), England	{ 10 0	{ 7½	6	Jekatarina Ids., Lapland	6 23	10	
	{ 12 0			Jerba, Mediterranean -	3 10	7	5
Denmark -	2 36	9		Jericoacoara, Brazil -	11 30	12	
United States -	12 22	4	3	Jersey (St. Helier), English	6 25	30½	21¾
., Africa, W. C.	1 0	6	4	Channel.			
e, England -	5 42	27½	21½	— (Rosel) -	6 15	30	21½
de, Brazil -	12 30	5	4	Jervis Bay, Australia, E.	6 20	6-9	
td', Africa, W.	3 0	8-10		Coast.			
				Jezirat Arabi, Persian	6 30?		
t, Filipinas -	12 0	5½		Gulf.			
ahamas -	8 0	3½	2½	— Hamar-al-nafur,	9 30	10	
ble Id., Gala-	1 56	6		Arabia, S.E. Coast.			
				— Jùn Persian Gulf	11 30	10	
y, Florida -	8 23	2½	1¾	— Kabr " -		8½	
izree Bunder),	9 50	7		— Kais " -	0 45	7½	
stan, W. Coast.				— Kharg or Káreg „	8 0	6½	
e R., Africa, E.C.	4 15	10		— Larek " -	10 15		
, Ireland -	4 34	12½	9½	— Tumb " -		8	
Ireland -	5 10	11	8	Jiddah, Red Sea -		2	
Ireland, W.	4 36	12½	9½	Jijginsk Id., White Sea -	5 15	4	
				Joao San, Brazil -	6 24	14	10½
pe, Tierra del	2 0	4		Johanna Id., Comoro Ids.,	3 30	8½	
				Mozambique.			
t, White Sea -	11 55	16		John St., Bay of Fundy -	11 21	27	23
Scotland -	12 0	10		—, Newfoundland	7 30	7	
Scotland -	12 18	12	9½	—, River, Africa,	4 0	5	
or Rd., Aus-	8 0	9		S. Coast.			
. Coast.				—, River, U. S. -	7 28	5½	5
d, Scotland -	5 11	11½	8½	Jonquiere Bay, Gulf of	10 0	6	
England -	12 35	13½		Tartary.			
United States -	11 26	10½	8½	Joombas River, Africa,	8 10	6	
ad, Peru -	8 45	5		W. Coast.			
., Bermudas -	7 4	4		Jooria, Hindoostan, W.C.	2 0	16	12½
Cape, Magellan	1 0	8		Josef, San, Port, Patagonia.	10 0	30	25
				E. Coast.			
rbour, Choiseul	5 20	6		Jourimain Island, New	9 30	6	3
kland Islands.				Brunswick.			
1 -	8 53	7		Juande Nova, Madagascar		5	
oudres, R. St.	4 25	17	10	Juan Fernandez I., Chile	9 30	4	
ce.				Juan San, Porto Rico -	8 2	1½	
s, Africa, W. C.	6 35	13		— San Port, Peru -	5 10	3	
ape, Arabia,	9 0	10		Juby Cape, Africa -		8	
ast.				Judith Point, United States	7 32	3¾	3½
England -	4 44	21	15	Jukan Ids., Lapland -	9 0	13	
ort San, Ticao	6 30	6		Julian, San, Port, Pata-	10 45	30	
inas.				gonia, E. Coast.			
ort (N. Head),	8 15			Julianshaab, Greenland -	5 6	7	5
a.				Julien, St., Harbour, } 7 21 A.M.			
. Domingo -	irr.	2-3?		Newfoundland. } 6 30 P.M.			
Hindoostan, W.	11 35	9	7½	Junk River, Africa, W. C.	5 45	5	
				Junkseylon Id. (E. Side),	10 0	11½	
(Adam Cove),	2 14	5		Malacca Strait.			
oa.				Jura Island, (E. Side)	4 56	3½	2½
N. side, Gal-	2 34	5		Scotland.			
				— Feolin Ferry „	4 41	6½	4½

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs	Neaps.			Springs	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Kaikora Penin, New Zealand.	5 30	8	6	King Port, Falkland Ids.	7 30	5	
Kaipara Harb. (entrance), New Zealand.	10 55	10	8	Kingstown, Ireland -	11 10	11	8
Kalgalaksha, White Sea	6 50	7		Kinsale, Ireland -	4 43	11½	9
Kalian Point, Banka Strait	8 17*	12½		Kinsiang Point, China, E. Coast.	7 0		
Kandalaksha, White Sea	3 25	7		Kircubbin, Ireland -	12 42	11½	9
Kanushin Cape, White Sea	11 54	15		Kirindi, Ceylon -	3 30		
Kapiti Island, New Zealand	9 0	6		Kirkcudbright, Scotland	11 10	23	
Karachi Harb. (entrance) Hindoostan, W. Coast.	10 30	9½	6	Kirkwall, Orkneys -	10 9	10	7
Karakoa Bay, Owyhee -	3 49			Kishm, see Kesm.			
Kata, Japan Sea -	6 4	6½		Kitnapatnam, Bay of Bengal, W. Coast.	11 0	1½	
Katwyk, Netherlands -	2 30	5	7	Knox Bay, America, N. W. Coast.		11	
Kawau Id., New Zealand	6 30	10		Koepang, Timor -	11 0	9	6
Kawhia Harb., New Zealand.	9 30	12		Kokohu, New Zealand -	10 15	10	7
Kedewarry, Hindoostan	9 57	9		Kok-si-kon Prt. (Formosa) China Sea, E. Coast.	11 30	3	
Keelacarry, Ceylon -	11 0			Koombanah B., Australia, W. Coast.	9 0	½-3	
Kedgerree, Bay of Bengal	11 30			Koree R. (Monda Point), Hindoostan, W. Coast.	11 40	11	
Keeling Islands (Port Refuge), Indian Ocean.	5 30	5		Kouloi River -	1 15	20	
Kegashka B., G. St. Lawrence.	10 45	5	3	Kou Zomen, White Sea -	3 30	6	
Kelung Harb. (Formosa), China Sea, E. Coast.	10 30	3		Koweit, Persian Gulf -	0 15	9	
Kenmare R. (W. Cove), Ireland.	3 52	10	7½	Krakatoa, Strait of Sunda	7 0	4	
Kenn Reef, Australia, E. Coast.	8 0	5½		Kuper Port, America, N. W. Coast.	1 40	13	10
Kennebec River (Hanniwells Point), U.S.	11 15	9½	8	Kuriyán Muriyán Bay and Islands, Arabia, S.E. Coast.	8 20	6½	
Kent Island, Bass Strait	11 10			Kurrachee, see Karachi.			
Kentish Knock, England	11 47			Kweshan Ids., China, E. Coast.	9 30	14	
Keppel Bay, Australia, E. Coast.	9 30	9-14		Kyem River, White Sea	5 23	4	
Keret, White Sea -	3 8	6		Kykduin, Netherlands -	7 0	12	
——Point, White Sea	4 30	5½		Kyle Akin, Loch Alsh, Scotland.	6 16	15½	11
Kerguelen Island, Indian Ocean.	2 0	2		Kyle Rhea, Scotland -	6 0	15	11
Kesm, Persian Gulf -	11 0	12		La Poile Bay, Newfoundland.	9 0	6	4
Kettle Cove, United States	7 48	5	4½	Labuan Id., China Sea, E. Coast.	9 45	6	
Khór Jerámeh, Arabia, S.E. Coast.	9 30	10		Labyrinth Ids., Magellan Strait.	0 30	5½	
Kilbaha, Ireland -	4 16	13	9½	Lacul Harb., St. Domingo	6 0?	3?	
Kilda, St., Hebrides -	5 30			Lady Bay, Australia, S.C.		4	
Kildin Id., Lapland -	6 45	12		Lady Elliot Islet, Australia, E. Coast.	9 0	7-8	
Kilkieran Cove, Ireland -	4 34	15½	11	Lagos, Portugal -	2 7	13	
Killala Bay, Ireland -	5 22	10½	8	——River, Bight of Benin.	6 0	2	
Killeany Bay, Arran Ids., Ireland.	4 28	13½	10	Iaguimanoc Port, Luzon	1 30	5½	
Killingholme (Humber R.), England.	6 2	19½	15½	Laguna de Terminos, G. of Mexico.	noon.	1½	
Killybegs, Ireland -	5 16	11½	8½	Lamalin, Newfoundland	9 15	8½	
Killyleagh, Ireland -	12 40	11	9½	Lambayeque Rd., Peru -	4 0	3	
Kilmichael Point, Ireland	8 30	4½	3	Lamlash, Scotland -	11 49	10	7
Kilrush, Ireland -	4 42	14	10½	Lamo Harb., Africa, E. Coast.	4 6	11	
Kincardine, Firth of Forth, Scotland.	2 53	17½	15	Lancaster, England -	11 16	5½	
King Id., Bass Strait -	1 0						

* In N.W. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
pping, Cleddau	6 27	20	14½	Little Egg Harbour, } United States	7 10	4½	3½
Wales.				Little Fish Bay, Africa, W. Coast.	2 30	5-6?	
anCrossing, Yang- yang.*	1 40	12	8	Little Gull Island, U. S. -	9 38	3	2½
Bay, China, E.C.	10 0	■		Littlehampton, England	11 36	16	11½
ste, Canary Ida. -	1 0?	9?		Little Metiz, G. St. Law- rence.	2 10	13	8
B, Magellan Strt.	11 30	9		Little Milford Quay, River Cleddau, Wales.	6 31	■	13½
Scotland	11 50	■		Little Natashquan, G. St. Lawrence.	11 0	■	■
Id., Africa, E. Cat.	4 0	10		Liverpool, England -	11 23	26	20½
e Bay, Tierra del	2 5	4		Bay, Nova Scotia.	7 50	8	5
Great and Little, foundland.	8 15	7	4	Liza Bay, Lapland -	5 58	9	
Harb., Tierra del	1 0	6		Lizard Id., Australia, E. Coast.	9 15	7-10	
Cove, Chile -	9 20	5		Point, England -	5 0	14½	10½
ice, Great St., Harb.	8 30	7	4	Llanelly (Bar), Wales -	6 16	28	21
foundland.				Lloyd Port, Bonin Ida. -	6 8	3	
ave Cape, Nova	7 48	7	5½	Loanda, San Paul de, Africa, W Coast.	4 30	5	
ia.				Lobah Point, Banka Strait	11 0†	10	
ire Strait, Tierra	4 0	7		Lobito B., Africa, S.W. Coast.	2 20	5	
uego.				Lobo Point, Peru -	8 0		
Fiord, Faroe Ida.	0 30	6½	4½	Lobos Cay, Bahamas -	7 40	3	
Scotland - -	2 17	16½	12½	Lobos Head, Patagonia, W. Coast.	0 29		
Shoal, England, east.	6 0			Loch Aline, Scotland -	5 33	13½	10½
c Cove, Tierra del	4 40	8		Alsh "	6 16	15½	11
Port, Barrow	12 6	6	4½	Broom "	6 40	14½	10½
Bay of Fundy -	11 18	24½	21	Carron "	6 29	16½	11½
k, Shetland	10 30	6	4	Duich "	6 0	15½	11
g Harb., Bay of	11 19	23½	20	Dunvegan, "	6 7	15½	11
ly.				Eil "	5 15	13	9
River, Chile -	10 30	■		Eport "	6 6	12½	9½
Port, Madagascar	3 30	7½		Eriboll "	7 43	14½	11
r Bay Africa, W.	12 0	6-7		Erisort "	6 43	15½	11½
a.				Ewe "	6 39	14½	10½
Cape, St. Labrador	6 30			Gail "	12 6	10	6
Cape (G. of Siam),	5 7	6½		Hourn "	5 45	13½	10½
m Sea, W. Coast.				Inver "	6 41	14	11
to (Bar), Yellow	4 0	11		Laxford "	6 44	15	11½
Sea.				Long "	12 6	■	
— (entrance) -	5 0	12		Maddy "	6 6	12½	9½
ing Gulf (Sand	4 50	7	5½	Mudart "	5 44	13½	9½
a), Yellow Sea.				Nevis "	5 47	14½	10
— N.W. Head of	5 30	10	8½	Roag "	6 11	■	8
				Ryan "	11 12	■	
ek, Ireland -	6 16	18½	13½	Strivan "	11 55	6	
River (entrance),	4 15	12		Tarbert, West, Har- ris Island, Scotland.	6 4	11½	8½
ca, E. Coast.				Tarbert, East, Scot- land.	6 10	13½	10
a, Persian Gulf -	12 0?			Tongue "	7 53	15	14
Island, Canton R.	12 0	7½		Torrison "	■ ■	15	11
na, E. Coast.				Tuadh "	5 29	11½	8
.(Belem), Portugal	2 30	12	9	Lofoten Ida., Norway	12 0	9	7½
or Bay, Ireland -	4 23	13½	10	Loheia, Red Sea	1 30	3	
ib Harb., Nova	8 0	6½	4½				
ia.							
Bay, China, E. C.	10 15	15					
benchmark -	2 21	6					
Ridge, White Sea -	11 45	15					

observations made in March 1861 by Commander Ward, H.M.S. Acton. † In S.E. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Loire R. (St. Nazaire), France.	3 40	15½	11	Madame Id., Madagascar	4 0	5	
Lomas Point, Peru	8 19	5		Madoc Port, Wales	7 30	17	
Lombok, (Ampanan B.), Java Sea	8 0	0		Madras Road, Coroman- del Coast.	7 34	3½	
London Bridge, England	2 7	19½	16½	Magadoxa, Africa, E. Cst.	4 30	■	
— Docks, England	1 57	19½	17	Magdalen Ids., G. St.	8 20	3	
Londonderry, Ireland	8 1	7½	5½	Lawrence.			
Looe (East), England	5 26	16	13	Magdalena Sta., Island, Magellan Strait.	12 0	10	
Lookout Point, United S.	0 58	2	1½	Magdalene B., California	7 35	6½	
Lopez Cape, Africa	4 30	4-6?		Mahato Id., Africa, E. C.	4 30	7	
L'Orient (Port Louis), France.	3 11	13	9½	Mahneah R., Africa, W.C.	7 40	11	
Lo-shan-kau, Yellow Sea	4 30	11	9	Mahone Bay, Nova Scotia	8 0	7	
Lough Larne, Ireland	10 48	6½	6½	Mahons R., United States	9 52	7	
— Rossmore, Ireland	5 20	11	8	Maiden Rocks, Ireland, N.E. Coast.	10 43	6½	
Louis Port, France	3 11	13	9½	Majambo B., Madagascar	4 30	16	
— Mauritius	12 30	3	2½	Makatein, Arabia, S.E.	9 0	6	
Louis, St., Bay, St. Do- mingo.	irr.	2-3?		Coast.			
Louisburg Harb., Cape Breton Id.	8 0	5	4	Makalleh, Arabia, S.E.	8 30	7	
Low Bay, Falkland Ids.	5 0	5½		Coast.			
— Port, Patagonia, W. Coast.	0 40	7		Makumba R., Madagascar	4 45	17	
Lowestoft, England	9 57	6½	5½	Makung Harb., Pescadores, China Sea.	10 30	9½	
Lowly Pt., Spencer Gulf, } Australia, S. Coast } Luabo River (entrance), Africa, E. Coast.	7 0	6-8		Malabrigo Port, Peru	5 0	2	
Lucas San, Bay, California	9 20	9½		Malacca Strait (light ves- sel one fathom bank).	6 0	15	
Lucipara Pass, Banka Strait.	irr.	10	7½	Malacca Strait (off Mount Formosa).	8 0	11	
Luis St., Texas, G. of Mexico.		1½	½	— Road, Malacca St.	7 30	11	
Luis Obispo, San, California	10 8	4½	3½	Malaga, Spain	12 0	3	
Lunaire Bay, Newfound- land.	7 0?	2-3?		Malahide Inlet, Ireland	11 15	10	
Lundy Island, England	5 15	27	20	Malcolm Atoll, Maldives	10 30	3	
Lung-mun Harbour, Yellow Sea.	10 0	7		Maldon, Chelmer River, England.	12 32	10	
Lyme Regis, England	6 21	11½	8½	Malé, Maldives	12 30	3	
Lynn Deep, England	6 0	23		Malludu Bay, Borneo	10 30	6-8	
— Harbour		18		Malo, St., France	6 5	35	
— Road		20		Malpelo Point, Peru	4 0	10	
Mabon River, C. Breton Id.	9 0	4		Man-of-War Cay, Bay of Honduras.	8 10	4	
Macao, China, E. Coast	10 0	6½		Manal Island, New Zealand	7 0	■	
Macassar, Celebes	4 40	5½		Manama, Persian Gulf	5 20	7	
McDougall Harb., Africa, S.W. Coast.	2 30	5½		Manawatu River, New Zealand.	10 0	8	
Maccio, Brazil	4 30	8½		Mancenilla Bay, St. Do- mingo.	7 0	4-5	
Machias, Seal Id., Bay of Fundy.	11 5	18	14½	Mandavee Roads, Hin- doostan, W. Coast.	11 50	15	
Macowa, Red Sea	0 30	2		Mangalaum Id., China Sea, E. Coast.	11 0	5	
Macquarie Harbour, Tasmania.	7 30	3		Manicouagon River, R. St. Lawrence.	2 15	12	
— Port, Aus- tralia, E. Coast.	8 56	4 5		Manila (Luzon Island), China Sea, E. Coast.	10 40	2½	
Macquereau P., G. St. Lawrence.	2 0	5	■	Manning River, Aus- tralia E. Coast.	10 0		
				Manora P., Karachi, Hin- doostan, W. Coast.	10 30	9½	
				Manorah R., Hindoostan, W. Coast.	1 30	16	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Port, Ecuador -	3 4	6		Mayumba, Africa, S.W.C.		7	
San Har. (entrance),	9 30	13	10	Mazambo Port, Mada-	4 30	15	
Zealand.				gascar.			
branch Harb., Falk-	7 40	7½		Mazatlan, Mexico, W. Cst.	9 40	7	
land Ids.				Meichen Sound, China, E.C.	12 30	17	
Light (Thames),	12 5	14½	10½	Melbourne, Australia, S.C.	1 20	3	
land.				Melinda P., Africa, E. C.	4 15	11	
Green Point, G. of	2 0	5	3	Mellacoree R., Africa,	7 40	11	
Lawrence.				W. Coast.			
ham, Brazil -	7 0	17½		Mellish Reef (Sand Cay),	7 55	5-6	
head, United States	11 30	12		Australia, E. Coast.			
Harb., Tierra del	3 10	6		Mellon, Ireland -	6 1	18½	13½
go.				Melo Port, Patagonia, E.C.	3 40	15	
uf, St., France -	9 55	20		Memory Rock, Ba-	7 50	3	
Harb., Falkland Ids.	6 0	6		hamas.			
de, England -	11 40	15½	13	Menadou Bay, C. Breton	8 15	5½	
St., Id., Chile -	10 20	6		Island.			
Van Diemen Cape,	8 0	7		Menam River, (Paknam),	5 7	9½	
Zealand.				China Sea, W. Coast.			
ow, River Tavy,	5 47	8½	4½	Menemsha Bight, U.S. -	7 45	4	2½
land.				Mensular Id., S.E. end,	6 0	4	
St., Bay of, St.	8 0P	12		Sumatra.			
ingo.				Merbat, Arabia, S.E. Cst.	9 0	6½	
St., United States	1 14	3	2½	Mercy Bay, Banks Land		2	
i River, Guayana	5 30	8	6	Mercury Bay, New Zea-	7 21	7	5
an, Bay of Bengal	2 20	21		land.			
St., Cove, Tierra	3 30			Mergui, Bay of Bengal,	10 30	18	
Fuego.				E. Coast.			
C. Horn	3 50	8		Merigomish, Nova Scotia	10 6	5½	3½
Tierra del Fuego.				Merjee R., Hindoostan,	11 0	7	
St., de la Arena,	3 30	15		W. Coast.			
n, N. Coast.				Merville, France -	9 36	21	17½
Vas Rocks, South	3 45			Metway Port, Nova Scotia	7 50	8	5
atic.				Mevagizey, England -	5 4	15½	12
Cape St., New-	8 30	7	5	Mexillones Port, Bolivia	10 32	3	
land.				Mezen, White Sea -	1 48	15-22	
St. Harb., Mada-	4 0	5		Miau-tan, (Depôt Bay),	10 35	6	
ar, E. Coast.				Yellow Sea.			
Newfoundland -	7 40	7½	5	Miaveness, Faeroe Islands	3 12	6½	4½
Port St., I. of Man	11 10	20	16	Michael, St., Azores -	12 30	6	
St., Scilly Is. -	4 27	16	12	Michael Seymour Port,	5 30	3	
ort, England -	11 3	18		Gulf of Tartary.			
h, Persian Gulf -	11 15	6		Middle Cove, Tierra del	3 30		
B, New Zealand -	11 10		6	Fuego.			
cre Bay (Tasman	8 45	13	9	Middle Island, Patagonia,	12 0		
ner), New Zealand.				W. Coast.			
cre Bay, Motu Pipi	9 50	14	10	Middlesbrough, R. Tees,	3 55	13	
er, New Zealand.				England.			
wah, Red Sea -	1 0	3		Middleton R., Bight of	4 15	5	
River, G. St.	2 15	11	7	Benin.			
rence.				Milford Haven (St. Ann	5 56	24	18
River, Chile -	10 0			Lighthouse), Wales.			
min, Bay of Bengal,	2 0	22	17	Milford Sound, New Zea-	9 15	6	6
lius (Port Louis) -	12 30	3	2½	land, Mid. Island.			
— (Grand Port) -	1 0	1½		Millman Island, Palawan,	10 27	2½	
ape, United States	8 19	6	5	W. Coast.			
ry Bay, Palawan -	9 55	3½		Millport, Cumbrae Island,	11 50		6
Id., Indian Ocean	4 0	6½		Scotland.			
ta Id., Moambique	4 10	11½		Min R. (Temple Point),	10 45	19	14½
				China, E. Coast.			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Ncaps.			Springs.	Ncaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Min R. (Losing Island), China, E. Coast.	12 0			Mount Desert Island, United States.	11 10	13	
Mindanao, Filipinas -	7 0	6		Mourondava, Madagascar, W. Coast.	4 45	12	
Minehead, England -	6 30	35	26½	Mouton Port, Nova Scotia	7 54	7½	!
Mingan Harbour, Gulf St. Lawrence.	1 16	6	4	Moville, Ireland - - -	7 6	7½	!
Mingan Id., G. St. Lawrence	1 30	6	4	Mozambique Har., Africa, E. Coast.	4 15	12	
Minimegash, Prince Ed- ward Island.	3 30	5	3	Mucaras Reef, Bahamas	7 40	3	
Minow Islands, Mada- gascar, W. Coast.	5 0	15		Mugeres Harb. Bay of Honduras.	9 30	1½	
Minquiers Rocks, France	6 6	35	26	Mull of Cantyre, Scotland	10 35	4	
Miramichi (Bar), Gulf St. Lawrence.	5 30	5	3	Mulroy Bay (Bar), Ireland	5 40	11½	!
Mira-por-voa, Bahamas -	9 30	3	2½	Mumbles Lt. House, Wales	6 1	27½	26
Mirs Bay (Tide Cove), China, E. Coast.	10 0	6½		Mungullo or Mongallo R., Africa, E. Coast.	4 45	12	
Miscou, G. of St. Law- rence.	2 30	5	3	Murdounah Id. (E. Cst.), Red Sea.	6 0	3	
Mississippi, S. W. Pass, Gulf of Mexico.		1½		Murray Islands, Torres Strait.	9 30	10	
Mistanoque, Labrador -	10 30	6	3	Murray Pass, Bass Strait	11 10	8	
Mistley Quay, Stour R., England.	0 48	11½		Musa Port, Babuyan Ids.		5	
Mobile, Gulf of Mexico	irr.	1-2		Mutlah River, (entrance to Biddah River), Bay of Bengal, W. Coast.	10 0	14	
Mocha Island, Chile -	10 30			———— (Muda Kali),	11 45	15	
———— Road, (E. Coast), Red Sea.	12 0	4½		Bay of Bengal, West Coast.			
Mogador, Africa, W. Cst.	1 18	10-12		Mutton Island, Ireland, W. Coast.	4 20	13½	!
Mollendo, Peru - - -	8 0	5		Myggenæs Fiord, Færoe Islands.	9 0	9½	!
Molynæux Bay, New Zea- land.	3 0	8	6	Naafe R., Bay of Bengal, E. Coast.	10 0		
Mombaza Port, Africa, E. Coast.	4 0	11		Naalsøe Fiord, Færoe Islands.	4 0	6½	
Monach Ids., Scotland, W. Coast.	5 44	12½	8½	Nafa-Kiang, Loo Choo Islands.	6 28	7	
Mondego (Bar), Portugal	2 30	7		Nagasaki Bay, Japan Sea.*	7 15	9	!
Monganui Harb., New Zealand.	8 15	9	7	Nagore, Bay of Bengal, W. Coast.	8 15		
Monomoy, United States	11 30	5½	4	Namki Ids., China, East Coast.	8 30	17	
Monrovia, Africa, W. C.	6 0	6		Namoa Island (Clipper Road), China, E. Coast.	11 15	7	
Montauk Pt., United States.	8 20	2½	2	Namquan Harb., China, E. Coast.	10 0	17	
Monterey, California -	10 22	4½	3½	Nanaimo Harb., Gulf of Georgia.	5 0	14	
Montrose, Scotland -	1 25	13	10	Nancowry Harb., Nicobar Islands.	9 15	8½	
Monts, Point de, Gulf St. Lawrence.	12 0	12	6	Nangamessie Harbour, Sumba.	11 30	17	!
Moreno (Constitucion Road), Peru.	10 0	4		Nangka Id., Banka Strait		12	
Moreton Bay, Australia, E. Coast.	9 30	3-7		Nansaree River (Bar), Hindoostan, W. Coast.	3 0	18	
Morewellham, R. Tamar, England.	6 12	10½	6½	Nantucket, United States	12 24	3½	
Morjovets Id., White Sea	11 20	17		Napoleon Road, Gulf of Tartary.	2 30	2½	
Morlaix Road, France -	4 53	24	18				
Morro (Sandy Pt.), Ecuador.	5 0	11					
Mossel B., Africa, S. Coast.	3 15	6					
Moudiuga Id., White Sea	5 50	3½					

* Deduced from observations made in 1861, by Commander Ward, H.M.S. Acteon.

Loc.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Bay, Madag.	4 30	15		Nicholson Port (Lambton Harbour) New Zealand.	4 30	5	3
Coast.				Nicobar Id. (Nancowry Harb.), Indian Ocean.	9 15	8½	
rst), Magellan	9 0	36-42		Nicolas, St., Bay, Magellan Strait.	3 6		
second), Ma-	10 0	23		Nicoya Gulf (Port Herradura), Cent. America.	3 9	10	
nit.	6 17	7		Nieuport, Belgium	12 18	16	18
kura) Japan	6 17	7		Nieuwediep, Netherlands	7 27	1	3½
nt, Bristol	6 25	33	25	Niger River (Nun entrance), Africa, W. Coast.	4 8	6	
Providence,	7 30	3-4		Nikolskoi Chan., White Sea.	5 25	3	
, Tierra del	4 0	6		— Twr., White Sea	6 0	2	
Africa, S. C.	4 30	6		Nimrod Sound, China, E. Coast.	10 30	20	
t, France -	3 42	11	9½	Ninepin Group, China E. Coast.	10 0	5	
France -	3 40	15½	11	Nin-po-fu, Yung River, China E. Coast.	1 0	9	
England -	12 6	12½	10	Nisqually, America, N.W. Coast.	6 0	11	11
bour, Oregon	12 33	7½	6½	Noamh Island, Scotland	5 2	11½	7
st, England -	9 46	7½	5	Noel, Bay of Fundy	12 41	50½	43½
B. of Bengal	5 0	3		Noir Island, Tierra del Fuego.	2 30	5	
bour, Nova	8 12	7	5½	Noirmontier, France	3 2	16	11½
, Patagonia	11 0	14		Nolloth Port, Africa, S.W. Coast.	2 30	5½	
Zealand -	9 50	14	10	Norderney, Germany	10 30	8	
, Gulf St.	2 10	13	8	Nore, England	12 30	15½	13
River St.	8 30	14	9	Norfolk Island, S. Pacific	7 45	7	
l (entrance),	7 57	4½		North Cape, C. Breton Id.	8 0	4	
ates.				Edisto River, United States.	7 10	7	5½
United States	11 53	7	6½	North Harbour, Newfoundland.	8 0	7½	5
United States	11 16	6½	5½	Sands, Malacca Strait.	5 30	15	12
lon, United	9 28	3	2½	Nosa Island, Madagascar	5 0	16	
lence, S. W	7 30	4		Nova Zembla Harbour, Lapland.	6 36	10	
mon.				Nuevo Gulf, Patagonia, E. Coast.	7 0	10	
lle, United	11 22	8½	7½	Port, Central America.	3 10	12	
reland -	6 4	12½	10	Nukulan Port, Fiji Ids.	6 47	5½	
ound, Tierra	3 30			Nunes River, Africa,	10 0	15	11½
United States	8 13	5½	4½	Nymnde Gab, Jutland	2 41	2	
t, United	11 22	9	7½	Nysna Harbour, Africa, S. Coast.	3 45	5	
Australia, E.	9 45	6-7		Oban, Scotland	5 22	12	9½
England -	4 23	10½		Obb of Harris, Isle of Harris, Scotland.	6 16	11½	8½
reland -	10 30	16	12	Observatory Id., China Sea, E. Coast.	11 0	5½	
England -	11 51	20	15	Ocracoke Inlet, United States.	7 4	2½	2
ited States -	7 45	4½		Octavia Bay, New Granada.	3 30	13	
ales, (South	7 10	24	18				
— (West	7 0	12	9				
Wiles -	7 30	15					
ay, China,	8 30	5½					
, Harb., G.	1 55	12	7				
ce.							
Port, Peru	5 15	3					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Oelar Cape, Banka Strait	6 30	12		Oystreham, France -	9 38	21	10
Oibo Harb., Africa, E.C.	4 15	6		Packsaddle Bay, Tierra del Fuego.	3 30	6	
Olaveaga, Bilbao River, Spain.	3 15	12		Padstow, England -	5 13	20½	10
Old Pt., Comfort, United States.	8 17	3	2½	Pagham (entrance), England.	11 30	16½	15
Old Providence, Bay of Honduras.	irr.	1		Paimpol, France - -	6 0	31	20
Olenji Islands, Lapland -	7 30	12		Palais, Port le, Belle Ile, France.	3 18	14½	10
Oleron, Ile d', France -	3 50	19		Palliser Cape, New Zealand	6 0	6	
Omaider Island (Gulf of Akabah), Red Sea.	6 0	4		Palma, Canary Ids. -	12 30?	9?	
Omersary R., Hindoostan, W. Coast.	1 45	18		Palmas Cape, Africa, W. Coast.	4 30	4	
Omonville, France -	7 29	15½	12½	Palmedo Road, Sumba Id.		15	
'Om-rasas-Masirah, Arabia, S.E. Coast.	10 0	10		Palmeira Point, Ceylon -	9 30	7-11	
One Fathom Bank Light, Malacca Strait.	6 0	15	12	Paloan Bay, Mindoro -		5	
Onega River, White Sea	9 17	6-7		Pamarung Ids., Borneo, E. Coast.		8-10	
Ooloogan Bay, China Sea, E. Coast.	9 30	5½		Pampang Bay, Java -		7-8	
Oonting Port, Ioo Choo Islands.	6 35	8		Panama Road, Central America.	3 23	15-22	10-
Oösima, Japan Sea -	6 50	5		Pancol, China Sea, E.C.	9 40	6	
Oporto, Portugal - -	2 30	10		Pansand Hole, England -	12 0	15½	13
Orange B., T. del Fuego	3 30	5		Paposo, Chile - -	9 40	5	
—Cape, Magellan Strt.	3 0			Paquique Cape, Bolivia -	10 45	-	
Orford Haven (Bar), England.	11 30	7½		Para, Brazil, N. Coast -	12 0	11	
— Port, California -	11 26	6¾	4¾	Parahayba, Brazil -	5 0	9-12	
— Quay, England -	12 30	7½		Parenga-renga Harbour, New Zealand.	7 54	7	
Orfordness, England -	11 15	8	6½	Parida Id., New Granada	3 15	10½	
Orinoco River (entr.) Guayana.	6 0	3		Parsboro, Bay of Fundy	12 17	43	37
Orleans Id., R. St. Lawrence.	5 40	17	13	Pasado Cape, Ecuador -	3 30	10	
Ormond, Kenmare River, Ireland.	3 43	10	7½	Pasages Port, Spain -	3 0	12	9
Ornsay, I. of Skye -	5 50	14¾	10½	Passage or Culebra P., Caribbean Sea.	9 0	1	
Orlov Letni C., White Sea.	5 18	4		— Id., Banda Sea -	noon	6	
Os Ilheos, Brazil -	4 30			Passandava Bay, Madagascar, W. Coast.	5 0	15	
Osaki, Japan Sea -	5 55	6½		Patapsco R. (Bodkin Pt.) United States.	5 42	1½	1
Oscuro Cove, Patagonia, W. Coast.	0 55	20		Patersons Inlet, New Zealand.	1 10	8	0
Ostend, Belgium -	12 25	19	15	Patrick Port, Scotland -	11 10	15	15
Otago Har., New Zealand	2 50	7	5	Patta B., Africa, E. Cst.	4 30	10	
Otaheite, South Pacific -	noon	1½		Paul de Loanda, San, Africa, S.W. Coast.	4 30	5	
Otterswick, Orkneys -	9 13	11	8	Paul St. Id., Indian Ocean	11 0	3	
Otway Port Patagonia, W. Coast.	11 37	6		— G. St. Lawrence	8 0	5	
Ounalashka Id., America, N.W. Coast.	7 30	7½		Paumben Pass, Bay of Bengal, W. Coast.	1 30	2	
Ouro R., Africa, W. Cst.	12 0	8-9		Payta Port, Peru -	3 20	3	
Ouse, R. (Goole), England	7 44	14		Peckett Har., Magln. Strt.	12 0	6	
Ower Shoal, England, E. Coast.	6 30			Pedro Gonzales, New Granada, (Trapichi Island).	3 50	16	
Oxbaasheia, Norway -	12 0	8		Pedro San., Pass, Patagonia, W. Coast.	0 30	9	
Oyster Bay, United States	11 7	9½	8	— San Bay, California	9 39	4¾	
				Peel, Isle of Man -	11 8	16½	15
				Pegasus Port, New Zealand	11 50	8	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
o River, (entrance), low Sea.*	3 10	10	8-9	Philip B., Hobson Bay, Australia, S. Coast.	3 0	3-4	
r Islands, N. Pacific		6		Piankatank R. (Cherry Point), United States.	10 5	2	$\frac{3}{4}$
an Lagoon, Kangaroo , Australia.	5 0	6		Pichidanque Bay, Chile -	9 20	5	
us Sound, New	9 35	11	7	Pictou Har., Nova Scotia	10 0	6	4
land.				Pidioe Bay, Lombok -		10-12	
a Channel, Mozam-	4 0	11		Piel Harbour, England -	11 5	28	21
ue.				Pierre, St., Newfoundland	8 33	6 $\frac{1}{4}$	4 $\frac{1}{2}$
— Id., Mozambique	4 15	12		Pigeon Bay, Yellow Sea	11 45	8	
roke Dockyard,	6 12	21	15 $\frac{1}{2}$	Pihkishan Ids., China, E.C.	8 30	17	
lea.				Pillar C., Magellan Strt.	1 0		
ig, Malacca Strait -	12 0	9	7 $\frac{1}{2}$	— Cape, Tasmania -	1 0	6	
l Cape, Tierra del	6 2	12		Pillars, R. St. Lawrence	5 0	17	10
go.				Pinas Bay, New Granada	3 15	14	
he, Portugal -	1 54			Pinmill, Orwell River,	12 20	12	
ark Rocks, France	3 16			England.			
ngton R., Bight of	4 15	5		Pio Quinto Port, Babu-	6 0	6	
in.				yan Islands.			
cola, G. of Mexico		1 $\frac{1}{2}$		Pisco Bay, Peru -	4 50	4	
lie, R. Tamar,	5 55	13 $\frac{1}{4}$	9 $\frac{1}{2}$	Piti Palena, Patagonia,	12 23	10	
land.				W. Coast.			
and Firth, Stroma,	9 47	9	6 $\frac{1}{2}$	Pitty, Hindoostan, W. C.	10 5	9	
S. Side.				Placentia, Newfoundland	9 15	8	
— Swona, E. Side	10 24			Playa Marie Bay, Cali-			
— W. Side	9 35			fornia.	9 20?	7-9?	
— Great Skerry,	11 4	9 $\frac{1}{4}$	6	Playa Parda Cove, Ma-	1 8		
E. Side.				gellan Strait.			
— W. Side	10 53			Pleasant Port, Falkland	5 0	6 $\frac{1}{2}$	
nce, England -	4 30	16	12 $\frac{1}{2}$	Islands.			
Isles, Middle Id. -	10 30	16		Plettenberg Bay, Africa,	3 10	6	
— South Islet,	10 30	14		S. Coast.			
ustralia, E. Coast.				Ploughrescan, France -	5 17	25 $\frac{1}{2}$	18 $\frac{3}{4}$
Id., G. of Aden -	12 0	7		Ploumanach, France -	5 15	24 $\frac{1}{2}$	18 $\frac{1}{2}$
mbuco, Brazil -	4 45	8-6		Plymouth Breakwater,	5 37	15 $\frac{1}{4}$	11 $\frac{1}{2}$
Banhos, Indian	1 30	5		England.			
an.				— (Sutton Pool)	5 32	15 $\frac{1}{4}$	11 $\frac{1}{2}$
se, La, Strait, Japan	10 30	6		— United States	11 19	11 $\frac{1}{2}$	10 $\frac{1}{2}$
				— New, New	9 30	12	9
Scotland -	3 35			Zealand.			
lore Ids. (Makung	10 30	9 $\frac{1}{4}$	7	Pomba B. Africa, E. Cst.	4 0	15	11
b.), China Sea.				Pomquet, Nova Scotia -	9 15	4	2 $\frac{1}{4}$
St., Bay, C. Breton	7 30	6	4	Ponga River, Africa, W.	7 30	12	9 $\frac{1}{2}$
nd.				Coast.			
— Harb., Prince	8 30	4	2 $\frac{1}{4}$	Poolbeg Lt. Hsc., Ireland	11 12	12-14	9-11
rard Island.				Poole, England -	{ 9 10	{ 6 $\frac{1}{4}$	{ 4 $\frac{3}{4}$
ead, Scotland -	0 34	10 $\frac{3}{4}$	8 $\frac{1}{2}$		{ 12 45	{ 14 $\frac{1}{2}$	{ 10 $\frac{1}{2}$
Passage, B. of Fundy	10 41	22	18	Poolewe, Loch Ewe,	6 39		
Port, B. of Islands,	10 42	5 $\frac{1}{2}$		Scotland.			
rfoundland.				Pootoo Island, China, E.	8 15	12	
Bay, St. Francis	12 0	6		Coast.			
, Australia, S. Coast.				Poqueldon Harb., Pata-	0 54	18	
ura Rock, Patagonia,	0 50	16		gonia, W. Coast.			
Coast.				Portaferry, Ireland -	12 0	18-21	12-16
elphia, U. States -	1 18	6 $\frac{3}{4}$	5 $\frac{1}{2}$	Port-au-Choix, Newfound-	10 47	5	
B., E. side, Ma-	9 30	24		land.			
in Strait.				Port au Prince, Saint	8 0?	1?	
.Port, Capel Bay,	2 30	3-4		Domingo.			
tralia, S. Coast.				Port-en-Bessin, France -	8 57	20	15 $\frac{1}{4}$
— entrance,	1 30	3-4		Portchester, England -	11 46	13 $\frac{1}{2}$	10 $\frac{1}{4}$
ralia, S. Coast.							

* Time and rise much affected by winds.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Portendik, Africa, W. C.	10 0	6		Pulo Aor, Sumatra, N.E. Coast.		5	
Porth Cawl, Wales -	6 8	28½	21½	Pulo Condore, China Sea, West Coast.	3 0	4	
Porth-dyn-lleyn, Wales	8 30	16		Pulo Leat, Gaspar Strait	2 30	4	
Portishead, England -	7 16	41½	31	Pulo Mendanao, " -	2 30	4	
Portland Inlet (Salmon Cove) America, N.W. Coast.	1 8	16		Pulo Panjang, G. of Siam	7 0	2	
----- United States	11 25	10	8½	Pulo Timoan (W. side), China Sea, W. Coast.	6 0	7½	
----- Bay, Australia, S. Coast.	Midnight.	4		Puluqui Id., Patagonia, W. Coast.	1 5		
----- Breakwater, England.	7 1	6½	4½	Puna Island, Ecuador -	6 0	11	
Porto Frio, Brazil -	2 40	4½		Pwlheli, Wales - -	7 46	13½	
Porto Praya, C. Verde Ids.	6 0?	5		Quaco, Bay of Fundy -	11 35	30	2
Portree, Isle of Skye -	6 32	15	10½	Quebec, R. St. Lawrence	6 38	18	1
Portrieux, France -	6 0	31	23½	Queda, Malacca Strait -	12 0	5½	
Portsbridge (Portsmouth) England.	11 48	6½*	4	Queen Charlotte Id. (entrance), New Zealand.	8 50	8	
Portsmouth Dockyard, England.	11 41	12½	10	Queensferry, Firth of Forth, Scotland.	2 37	18	1
Portsmouth, United States	11 23	10	8½	Queenstown, Ireland -	5 1	11½	
Possession Bay, Magellan Strait.	9 0	36-42		Quelan Cove, Patagonia, W. Coast.	0 28		
----- Cape, Torres Strait.	9 0	6		Quentin, Port San, California.	9 5	9	
----- Id., Torres St.	1 0	9½		Quicavi Bluff, Patagonia, W. Coast.	0 57	20	
Post Office Island (Charles Island), Galapagos.	2 10	6		Quicks Hole (S. side), U.S.	7 36	3½	
----- Id., Torres Str.	1 0	9½		----- (N. side) -	7 31	4½	
Pouinipet Island, Caroline Islands, N. Pacific.	6 0	4½		Quilca River, Peru -	8 0	6	
Poulamente B., Madame Id., C. Breton Id. -	7 50	6	4	Quilimane R. (entrance), Africa, E. Coast.	4 15	16	
Poulton-le-Sands, England	11 26	27½	21½	Quillebœuf, France -	10 6	9½	
Poverty Bay, New Zealand	6 5	6		Quiloa, Africa, E. Coast	4 45	12	
Pratas Shoal, China Sea	4 0	5		Quoile Quay, Strangford, Ireland.	12 45	11	
Preservation Inlet, New Zealand.	11 20	8	6	Rabat, Africa, W. Coast	1 46	9-12	
Preston, England -	11 49	10	4½	Rachada Cape, Malacca St.	5 30	13	
Prince Frederick Harb., Australia, N.W. Cst.	12 0	28		Radama Port, Madagascar, W. Coast.	4 40	13	
Prince of Wales Strait, Banks Land.		3		Ragged Id., Sombawa, Java Sea.	8 10	3	
Princes Id., Bight of Biafra	3 45	4½		----- Point, Borneo, E. Coast.		7	
Princess Royal Harbour, Australia, S. Coast	11 56	1-4		Raine Id., Torres Strait	8 10	10	
Provincetown, U. S. -	11 22	10½	9½	Rajahpoor Harb., Hindoostan, W. Coast.	11 0	12	
Pubnico (Beach Point), Bay of Fundy.	9 25	12	10	Rajang River, Borneo -	4 45	13	
Puerto Bueno, Patagonia, W. Coast.	1 40			Ramos R., Bight of Benin	4 20	5	
Puerto de la Luz, Gran Canaria, Africa, W. Cst.	12 52	10		Ramree Road, Bay of Bengal, E. Coast.	10 0	12	
Puerto de la Plata, St. Domingo -	7 30	3?		Ramsay Sound, Wales -	6 0	17	
Puget Sound (Nisqually), America N.W. Coast.	6 0	18	15	Ramsey, Isle of Man -	11 12	19½	1
Pugwash Har., Nova Scotia	10 30	7	4	Ramsgate, England -	11 44	15	1
Pulaski Fort, United States	7 20	8	7	Ramso Fiord, Norway -	10 45	7	
Pulicat Shoals, Coromandel Coast.	9 25	2½		Rangoon, Bay of Bengal, E. Coast.	5 30	21	
				----- R. (entrance) B. of Bengal, E. Coast.	3 15	21	
				Rappahannock (Saunders Wharf), United States	3 2	2½	

* Above the bed of the lake.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Noaps.			Springs.	Noaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Fun, Africa, E. C.	6 15	4		Rochelle, France -	3 31	17	13
ohommed (Gulf of	6 0	5		Rockport, United States -	10 57	10½	8
tharmah, Arabia,	9 0	8		Rockall, N. Atlantic -	3 30	12	
Coast.				Rocky Id., G. of Siam -	4 0	4	
Kheimch, Persian	11 45	7		Rodrigue Id., Ind. Ocean	1 45	■	
				Romania Point (Malay	10 30		
Asidah, Arabia,	8 30	5½		Penin.), China Sea,			
Coast.				W. Coast.			
Abali, Arabia, S.E.	10 0	10		Romdals Ids., Norway -	10 45	6	
t.				Rona (South) Light,	6 20	14½	10½
Hed, Arabia, S.E.	9 30	9		Scotland.			
t.				Roodwall Bay Africa,	2 30	6½	
illian, Ireland -	5 42	12½	9	S.W. Coast			
or (G. of Cambay),	2 15	■	13	Roque, Cape St., Brazil		10	8
oostan, W. Coast.				Roscoff, France -	4 46	23	17½
Cent. America	3 6	11		Rosel, Jersey, English	6 15	30	21½
avi Inlet, Pata-	0 44	14		Channel.			
W. Coast.				Roshnoff Cape, America,	7 30	15	
y. Ceylon, S. Cat.	2 20	2½		N.W. Coast.			
— (Pier), Ireland	10 31	■	4	Rota, Spain -	1 24	12½	■
— Labrador -	7 45	3½	1½	Rotterdam, Netherlands	3 45	7	
Durinn Strait -	5 0	10½		Rouen, France -	2 28		
Cove, Bass Strait	12 5			Rouge Harbour, New-	7 0?	2-4?	
ille, France -	6 20	35	26	foundland.			
ik, Iceland -	5 0	17½	13½	Roundstone, Ireland -	4 28	13½	10½
vous Id., Borneo,		8		Rovama River, Africa,	4 0	16	11½
Coast.				E. Coast.			
org, Denmark -	7 42	4		Royal Harbour, Ruatan,	7 45	3½	
r, R. Clyde, Scot-	1 15	9		Bay of Honduras.			
				Royal Port, Jamaica -	11 0	1	
ion B., Marquesas	2 30	4		Royalist B., Palawan, E. C.	11 0?	6½?	
Port, Tanna Id.	5 35	3		Royan, France -	3 38	13½	10
n Id., (St. Pierre)	noon.	3½		Rnapuke Id. (Foveaux St.)	1 0	8	6
n O. (St. Denis)	0 22	2½		New Zealand.			
n Id., (St. Gilles)	1 0	2½		Rugged Id., Bahamas -	8 0	3	
n O. (St. Paul)	1 7	4		— Nova Scotia	7 59	7½	6
oad, Fiji Islands.				Ruggles B., Falkland Ids.	7 30	5	
ukulan Port.				Rush Port, Ireland -	6 8	5½	3½
thio Strait -	10 0	7	5	Rutland Id., Ireland, W.	5 22	11	8
Lighthouse, Eng-	10 51	24	17	Coast.			
				Rye Bay, England -	11 20	22	17½
acto R., Gulf St.	3 30	■	2½	Sabine Pass, G. of Mexico		1½	
rence.				Sable Cape (Clam Point),	8 27	8½	6½
ond, United States	4 28	3½	2½	B. of Fundy.			
— Harb., Prince	6 0	3	2	— (Clarke's Harb.),	8 58	11	■
ard Island.				B. of Fundy.			
E., Australia, E. C.	9 20			Sable Island, N. side,	7 30	■	
neiro, Brazil -	3 0	4	3	Nova Scotia.			
legro, Patagonia,	11 0	14		Sable Island, S. side,	6 30	4	
oast.				Nova Scotia.			
mez, Africa, W. C.	10 0	15	11½	Sables d'Olonne, Les,	3 26	■	10
la Plata, La Plata	Noon	irr.	irr.	France.			
uche R., Campbell-	4 0	10	7	Saboga, New Granada -	4 9	14	
G. St. Lawrence.				Sabon Id., Durian Strt. -		11	
o, Spain, N. Coast	3 0	■		Sacred Bay, Newfoundland	7 23	2½	
B., Australia, S. C.	10 0	4		Sacrificios Pnt., Mexico,	3 15	6	
As, Atlantic -	5 15	10		W. Coast.			
Cape, R. St. Law-	9 30	6	4	Saddle Id., East, China,	11 0	■	
				E. Coast.			
rt, France -	4 6	17	13	Sado (Yebisu), Japan Sea	5 0	2	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neaps.			Spring.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Saguenay, Chicoutimi, G. St. Lawrence.	4 11	12	8	Santa Cruz or Agadir, Africa.	12 45	9	1
Saguenay, Tadousac, G. St. Lawrence.	2 45	17	10	Santa Island, California	9 55?	5?	4
Saintes, Caribbean Sea -	6 45			— Tenerife, Canary Is.	1 30	8	
Sal, C. Verde Id., Africa, W. Coast.	7 45	5		Santa Maria Island, Chile	10 20	6	
Salango Id., Ecuador -	12 41	12		Santander, Spain -	3 30	15	11
Salcombe, England -	5 41	15	11½	Santona, Spain -	3 30	12½	10
Saldanha B., Africa, W.C.	2 0	6		Saparoa Id., Moluccas -		6	
Sale Macowa, Red Sea -	0 30	2		Sapie Bay, Sumbawa -	1 0	10	
Salem, United States -	11 13	10½	8	Sarawak R. (Moratabas entr.), Borneo, W. C.	4 0	9	
Salm R., Africa, W. Cst.	8 10	6		Sarn Badrig or the Causeway, Wales.	7 30	13	
Salmedina Rocks, Spain	1 27	12½	8	Sarn-y-bwch Reef, Wales	7 40	14	
Saltsb., R. Tamar, Eng- land.	5 45	15	11	Saugor Id., B. of Bengal		12	
Salt Cay Anchorage, Bahamas.	8 15	4	3	Saumarez Reef, Australia, E. Coast.	8 0	6	
Saltees, St. George's Channel.	5 40			Savannah (city), U. S. -	6 13	7½	1
Salvador, San, Port, Falk- land Islands.	8 10	8		— (entrance,) U.S.	7 20	8	1
Samanco B., Peru -	6 30	2		Scales Point, Blackwater River, England.	12 0	14½	10
Sambilangs, Malacca St.		12	10½	Scalloway, Shetland -	9 30	5½	4
San Francisco (North Beach), California.	12 6	4½	3½	Scarborough, England -	4 11	15½	11
San Bartholomew Port, California.	9 10?	7-9?		Scarcies Rivers, Africa, W.C	7 10	10	
San Blas, Mexico, W. C.	9 41	6½		Seilly (St. Agnes Id.) -	4 30	16	11
San Juan (anchorage), California.	9 40?	5		— (St. Mary Id.), England.	4 27	16	11
— River, New	6 0	12		Sen Bear Bay, Patagonia, E. Coast.	12 45	20	
Granada -				Seaforth Loch, Athline, Scotland.	6 16	15	11
San Lucar, Spain -	1 53	12½	8	Seaham, England -	3 24	14½	10
San Miguel, California -	9 25	5	4	Seal Cove, Grand Manan, B. of Fundy.	10 54	20	11
San Rosa Id., California	9 30?	57	4?	Seal Id., C. Sable, Bay of Fundy.	9 49	12½	10
Sand Cay, United States	8 40	2	1	Seamount Bay, Mulroy B., Ireland.	6 44	7½	
Sandalwood Bay, Fiji Ids.	6 0	6?		Sebastian, San, Brazil -	2 0	4	
Sand Point, G. of Liau- tung, Yellow Sea.	4 50	7	5½	— Tierra del Fuego	7 0		
Sands Pt., United States	11 13	9	7½	— Spain, N. Coast	3 0	12	
Sandy Cape, Australia, E. C.	7 50	6-8		Sedashigur Bay,* Hin- doostan, W. Coast.			
— Cove, E. B. of Fundy	10 33	21½	17½	Sedili R., China Sea, W.C.	9 44	7	
— W., Bay of	10 47	23	19	Sein, Isle de, France -	3 21	17½	1
Fundy.				Seleney Bay, Lapland -	7 9	9	
— Hook, United States	7 29	5½	5	Selsea Bill, England -	11 45	16½	1
— Island, Madagascar, W. Coast.	5 0	15		Semuhmoo Bay, Juan de Fuca Strait.	2 0	12	
Sanguanga (entrance) Ecuador -	4 10	9		Senegal, Africa, W. Coast	10 30		
Sanguir Island, Moluccas		6		Serrana Bk. Mosquito Cst.		2	
Sangwin R., Africa, W. Cst.	5 15	4		Serranilla Bank, Mosquito Coast.	irr.	2	
Sanmoon Bay (St. George Island), China, E. Coast.	10 20	15		Seshain Islands, Hang-chu Bay, China, E. Coast.	11 45	14	
San-shui, Si Kuang, China, E. Coast.		5-6		Setubal, Portugal -	2 30	8	
Santa Catalina Id., Cali- fornia -	9 35?	57	4?	Seudre, River, (entrance,) France.	8 31	15	1
Santa Cruz R., Patagonia, E. Coast.	9 30	40	29	Seychelle Archip. (Mayhé Id. (Indian Ocean).	4 0	6½	
				Seypan Id., Ladrone Ids.	6 45	2½	

* Spring tides rise a.m. 6 feet, p.m. 7½ feet from October to March; and the contrary during the rest of the year.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
nda, Lapland -	8 20	12		Sir E. Pellew Islands,	7 30	4-7	
Bay, Gulf	1 40	9	5	Australia, N. Coast.			
rence.				Sisal, Gulf of Mexico -		2	
dún, Arabia,	9 20	10		Sitka, America, N.W.C.	0 34	5-7	
ast.				Skanpen Fiord, Farø			
afeh, Arabia,	9 45	10		Islands :			
ast.				Between Stormoe and	5 0	9½	7½
Iarb., Falkland	9 30	6		Sandoe.			
Yang-tee-Kyang	0 40	10	7	Between Hestoe and	5 30	9½	7½
E. Coast.				Sandoe.			
Si Kiang,				Skagen or the Skaw,	5 56	1	
E. Coast.				Jutland.			
ersian Gulf -	1 0	6		Skerry, Great, E. side,	11 4	9½	6
, Australia, E.C.	12 0	2-5		Pentland Firth.			
Harbour, New	1 0			Skerry, Great, W. side,	10 53		
ick.	8 0	4	2	Pentland Firth,			
en, Ireland -	5 32	11½	8½	Skerries, Ireland, N. Cst.	6 15	5	3
, England -	0 37	16	13½	— E. Coast. -	11 0	13	10
rb., Nova Scotia	8 6	6½	4½	Skip Ness, Scotland -	11 50	9	
and, Africa, S.C.	4 40	12		Skull, Ireland -	4 2	9½	7½
Island, U. States	10 58	8½	7½	Slaughden, Orford, Eng-	1 0	7½	
, Nova Scotia -	8 4	7	5½	land.			
: Island, Gulf	6 0	5	3	Slievebane Bay Ireland.	5 40	10½	7½
rence.				W. Coast.			
L., Africa, W. Cst.	6 0	11		Sligo (Bay), Ireland -	5 18	11½	
North, England	3 23	13½	10	Harbour, Ireland	5 23	11½	8½
b., Nova Scotia	7 54	6½	4½	Slyne Hd., Ireland, W.C.	4 30	13½	10
— (New Id.),	10 30			Smalls Lighthouse, St.	6 0	21	
nd Islands.				Georges Channel.			
1, Gulf St.	3 42	5½	3	Smerwick, Ireland -	3 50	11½	8
ice.				Smithville, United States	7 19	5½	4½
Bay, Yellow Sea	1 30			Smoky Bay, Australia,	12 15	6	
y, Australia, N.C.	6 0	18-25	14-20	S. Coast.			
— E. Coast -	8 30			Smyth Harbour, Tierra	12 0	6½	
ster B., Australia,	10 30	12-18		del Fuego.			
st.				Snape Bridge, Orford,	3 0	6	
2, England -	11 34	18	13½	England.			
, America, N.W.	1 0	13½		Sococa, France -	3 19	12½	8½
				Socotra Id., Indian Ocean	7 20	8	
or West River,				Sofala R., Africa, E. Coast	4 0	19	
E. Coast:				Solovet Road, White Sea	5 0	4	
(San-shui) -			5-6	Solway (Tarn Point),	11 22		18
(Shao-king) -			3	Scotland.			
(Wuchan) -			1-1½	Sosnovuia Bay, White Sea	2 40	6	
er, Malacca Str.	9 0	12		Sosnovets, White Sea -	11 44	18	
ff the town -		11		Souma, White Sea -	6 30	5½	
i Cape, Australia,	9 15	10		South Farallon, California	10 37	4½	3½
st.				South Rock, Ireland -	10 58	13	10½
one, Africa, W.C.	7 55	8		Southampton, England -	10 30	13	9½
L. (Bar), Sumatra	6 0	4½		—	12 45		
Japan Sea -	7 30	7		South West Bay, New	7 30	4	
Port, Japan Sea	5 0	3-5		Providence.			
ki, Japan Sea -	8 30	8	6	— Cape, N. Zealand	12 0	7	5
lay, Africa -	2 44	5½	3½	Southernness, England -	11 20	20	
t., Island, U.S.	7 43	8½	6½	Southwold, England -	10 20	6½	4½
2, New Harbour,	9 45	10	7½	Spain, Port, Trinidad -	4 30		3
a Strait.				Spensers Anchorage, Bay	11 42	39	33
rica, W. Coast-	5 0	4		of Fundy.			
rdy Ids., Torres	9 15	10		Bay, Africa, S.W.	10 50	5-6	
E. Coast.				Coast.			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Spring
		Spring.	Noape.			
	h. m.	ft.	ft.		h. m.	ft.
Spenser Gulf, (Thoroy Passage,) Australia, S. Coast.	12 0	6-8		Swansea, (Mumbles Lighthouse), Wales.	6 1	37½
Spicers Cove, B. of Fundy	11 35	37	30½	Swift Bay, Australia, N. Coast.	12 0	21
Spider Id., China, E. C.	10 0	17		Swona, E. side, Pentland Firth.	10 24	10
Spitzbergen (Bell Sound)	8 56	3½		W. side, Pentland Firth.	9 35	10
Spurn Pt. (Humber R.), England.	5 26	16½	15	Sydney, Australia, E. Cst.	8 38	4½
Staten Island, Tierra del Fuego.	4 30	8		Harb., Cape Breton	9 0	5
Stanton Id., Yellow Sea	1 30			Table Bay, Africa, W. Cst.	2 40	5
Stellacoom Port, Oregon	4 46	11	9½	Tabou R., Africa, W. Cst.	4 45	3-4
Stephen Port, Australia, E. Coast.	9 0	6		Tabuai Island, S. Pacific		3
Falkland Islands.	7 45	7½		Tadeo, San, River, Patagonia, W. Coast.	11 45	6
Stewart Harbour, Tierra del Fuego.	2 50	■		Tabiti, S. Pacific	noon.	1½
Stirling, Firth of Forth, Scotland.	3 52	7½	4½	Tahri, Persian Gulf	5 0?	
Stirrup Cays, Bahamas	7 0	4		Taichow Ids., China, E. C.	9 0	■
Stockton (Tees), England	4 40	11		Tai-Tai Bay, China Sea, E. Coast.	9 30	5½
Stonehaven, Scotland	1 10	14	11	Talcabuan, Chile	10 14	5
Stonington, United States	9 7	3½	3	Talcan Island, Patagonia, W. Coast.	1 3	15½
Stornoway, Lewis Island, Scotland.	6 46	13	9½	Ta-lien-whan Bay, Yellow Sea.	10 10	12
Strangford (Killard Point), Ireland.	10 53	■	11½	Tam-Sui Harbour China Sea, E. Coast.	11 45	7-11
Quay	12 31	10½	8½	Tamar R., George Town, Tasmania.	11 15	12½
Head of Lough (Turley Rocks).	12 44	11½	9½	Launceston, Tasmania.	1 0	12½
Streaky Bay (Blanchepoort), Australia S. C.	1 0	5		Port, Magellan Strait.	3 5	5
Stroma, S. side, Pentland Firth.	9 47	9	6½	Tamatave, Madagascar, E. Coast.	4 18	8
Stromness, Orkneys	9 0	10	7½	Tampa Bay, United States	11 21	1½
Suadiva Atoll, Maldives	1 0	4		Tanabé, Ki Channel, Japan Sea.	6 0	6
Sual Port, Luzon		6		Tanera, Summer Islands, Scotland.	6 37	14
Suderoe Fiord, Færoe Islands.	6 0	9½	7½	Tangier, Africa, N. Coast	1 42	■
Suez Bay (head of Gulf), Red Sea.	2 0	6		Tangtang Harbour, Madagascar, E. Coast.	4 30	6
Sughrá, Arabia, S.E. Cst.	8 0	6		Tanjong Api, China Sea		7
Sumburgh Head, Shetland	9 45			Tanjong Bolus, Malacca Strait.	9 30	10½
Sunderland, England	8 22	14½	11	Tanna, New Hebrides	5 35	3
N., England	2 30	15	11½	Tappahannock, U States	0 42	2
Supé Bay, Peru	4 50	3		Tappanooly Harbour, Sumatra.	6 10	6
Surat, Hindoostan, W. C.	4 0	19		Taranaki or New Plymouth, New Zealand.	9 30	12
Surin, St., France	4 11	14½	11	Tarbert, Ireland	4 57	14½
Surinam, Guayana	6 0	5½		Tarifa, Spain	1 46	6
Sussex Port, Falkland Islands.	8 15	6		Tarn Pt., Solway, Scotland.	11 22	23
Sutton Pool, England	5 32	15½	11½	Tarpaulin Cove, United States.	8 4	2½
Sviatoi Nos, Lapland	9 15	14		Tarrytown, United States	9 57	4
Svinoe Fiord, Færoe Ids.	12 0	6½	4½	Tatamagouche, Nova Scotia.	10 0	8
Swain Reefs, Australia E. Coast.	10 0	10				
Swan Id., Bass Strait	9 35	6				
River, Port Grey, Australia, W. Coast.	9 0	14				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
a Bay, Japan Sea	5 50	5		Tonning, Germany -	2 1	9	
a Harbour, New	7 10	6	4½	Tooniang Id., Bias Bay, China, E. Coast.	8 0		
id.				Torbay, England -	6 0	13½	10
., (entrance) Bay	10 30	20		Toro Point, Chile -	9 45		
agal, E. Coast.				Tortola, Virgin Islands -	8 30	1½	
ver (Bar), Scot-	2 6	16	14	Tortugas, Florida, U. S.	9 56	1½	1
				Tower Id., Galapagos -	?	?	
r-oo-bay, China	10 15	6		Townshend Harb., Tierra del Fuego.	2 30	5	
E. Coast.				Townshend Port, Oregon	3 49	5½	5
os Road, Baly. (N.	5 0	6½		Tracadie, Prince Edward Island.	7 0	3½	2
.)				Træ Islands, Norway -	11 45	7	
Harb., Ireland -	5 16	11½	8½	Trawbreaga Lough, Ire-	6 10	11½	8½
. (Bar), England	3 45	15		land.			
outh, England -	6 0	13	9½	Tréguier, France -	5 32	25	18½
Wales -	6 0	27	20	Trek Island, White Sea -	10 48	20	
e, Cape Verd Ids.,		8½	6	Trepassey, Newfoundland	7 0	6½	5
ta Cruz).				Tréport, France -	11 9	27	21
a, Azores -	12 32	4½		Tres Cruces Point, Pata-	1 15	16	
rka R., Lapland -	7 20	12		gonia, W. Coast.			
elling (West),	8 40	6	5	Triangles, Gulf of Mexico		1½	
erlands.				Trincomalee Har., Ceylon,	8 18	2	1½
a, White Sea -	3 17	7		S. Coast.			
l, Africa, N. Coast	2 23	2½	1½	Tringano R., G. of Siam,	8 0	7	
(outside Shoals),	6 30	4	3½	China Sea, W. Coast.			
erlands.				Trinidad (Port Spain),	4 30	4	3
y Sound, Australia,	10 45	12-18		Caribbee Islands.			
Coast.				Trinity Bay (Bull Id.)	7 22	3½	2
us St., Id., Africa -	3 25	4½		Newfoundland.			
son Id., New Zea-	11 30	8	6	Opening, Great	9 15	7-12	
				Barrier Reefs.			
y Passage, Spencer	12 0	6-8		Tristan d'Acunha, South		8	
f, Australia, S. C.				Atlantic.			
minde, Jutland -	3 34	2		Triton Harb., New-	7 0?	2-4?	
Hummock Island	10 30	10		foundland.			
(side), Bass Strait.				Tromsø, Norway -	1 45	8	
Kings Islands, New	8 0	7		Troon, Scotland -	11 50	10	7½
land.				Troubridge Shoals, Aus-	3 30	6	
Points Cape, Africa,	4 0	4		tralia S. Coast.			
Coast.				Truro, England (Town	5 5	10	6
Rivers, River St.	11 30	1		Quay).			
rrence.				Tsang-chow Id., Bias	8 30		
s Point, U. S. -	11 20	9½	7½	Bay, China, E. Coast.			
o, Scotland -	8 28	14½	11	Tsau-liang-hai or Chosan	7 45	7	5
Island, (Port San	6 30	6		Harb., Japan Sea.			
into) Filipinas.				Tsu-sima Sound, Yellow	8 30	8	
: Bay, Patagonia -	1 45	11		Sea.			
pak Harb., China,	12 0	8½		Tudwall, St., Road, Wales	7 45	14	
t Coast.				Tumaco Road, Ecuador -	2 33	12	
allier Bay, G. of	irr.	2		Tunis, Mediterranean -		3	
rico.				Turna Bay, White Sea -	9 54	11	
ue, Chusan, China,	11 0	12	9	Turner C., Prince Edwd.	6 10	4	2
Coast.				Island.			
go, Caribbean Sea -	irr.	3½		Turon B., Cochin China	3 0	4	
mory, Isle of Mull	5 36	13	9½	Tuticorin Harb., G. of	1 15	2½	1½
: Ali Point, Banka {	8 30PM*	12		Manar, Bay of Bengal,			
ut.	10 0AM†			W. Coast.			
(Seto-uchi), Japan	11 0?		5	Tutukaka Harbour, New	7 0	9	7
				Zealand.			
itabu, S. Pacific -	6 50	4					
ang Harb., China,	11 30	12					
Coast.							

* In S.E. monsoon.

† In N.W. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Tweed River (Danger Point), Australia E.C.	9 45	5-8		Victoria R., Mosquito Flat, Australia, N.W. Coast.	12 19	15-24	
Twofold B., Australia, E.C.	10 0	7	5	——— Sandy Island, Australia, N.W. Coast.	1 17	3-10	
Tylatiap Harb. Java, S.C.	8 45	3½		——— Turtle Pt., Australia, N.W. Coast.	7 15	7-13	
Tynemouth (Bar), England	3 20	14½	11	Vigo, Spain - - -	3 0	12-13	
Typa Anchorage, China, E. Coast.	10 0	7		Vin Harbour, G. St. Lawrence.	5 45	5	
Uist, North, Scotland, W. Coast.	6 10	11½	8½	Vincent, St., Cape, Madagascar, W. Coast.	4 45	12	
Ullapool, Loch Broom, Scotland.	6 40	14½	10½	——— Port St., New Caledonia.	5 50	4½	
Ummen Nakheilah, Persian Gulf.	7 30?	8?		Virgin C., Magellan Strait.	8 30	36-42	
Underwood Port, New Zealand.	6 10	8	6	Vivero, Spain, N. Coast -	3 0	15	
Union Bay, La Plata -	3 10	12	9	Vladimir, St., Bay, G. of Tartary.	irr.	2	
Union, Port la, G. of Fonseca, Cent. America.	3 15	10¾	8¾	Volcano Ids., China, E. Coast.	11 30	15	
Upernivik, Greenland -	11 0	8		Voronov C., White Sea -	11 20	17	
Upstart Cape, Australia, E. Coast.	11 0	6-8		Waagoe Fiord, Færoe Ids.	6 0	9½	
Urakami, Japan Sea -	7 30	6	5	Wahaay Harb. (Ceram), N. Coast, Moluccas.	6 0	3	
Uranouchi, Japan Sea -			5	Waikato R., New Zealand.	9 30	12	
Urie Firth, Shetlands -	9 45	6½	5	Walker Creek, Choiseul Id., Falkland Ids.	6 20	5½	
Ursula Id., Palawan, China Sea, E. Coast.	11 0	7½		———, R. Tyne, England.		10½	
Ushant, France - -	3 32	19½	13½	Wallace Har., Nova Scotia	10 30	8	
Ushruffi Islands, Red Sea	6 14	2		Wallis Id., Torres Strait	irr.	7	
Utria, New Granada -	4 0	12		Walvisch Bay, Africa, W. Coast.	1 54	6	
Værö, Norway - -	12 0	9	7½	Wanchew R. (entrance), China, E. Coast.	9 0	15½	
Valdivia Port, Chile -	10 35	5		——— (City), China, E. Coast.	9 30	15½	
Valentia Harb., Ireland -	3 42	11	8	Wanganui R., New Zealand.	10 15	8	
Valentine Harb., Magellan Strait.	2 0			——— Inlet, New Zealand.	11 20	7	
Valery St. en-Caux, France	10 46	27	21½	Wangari Harbour, New Zealand.	7 0	9	
——— sur-Somme, France.	11 46	27	21½	Wangaroa Harbour, New Zealand.	8 15	7	
Vallay, North Uist, Scotland, W. Coast.	6 10	11½	8½	Wangaruru Harbour, New Zealand.	7 10	9	
Vallenar R., Patagonia, W. Coast.	0 18	5		Wapitapun Harb., G. of St. Lawrence.	10 30	5	
Valparaiso, Chile -	9 32	5		Warleigh Quay, River Tavy, England.	5 47	14½	
Vansittarts Saddle, Yellow Sea.	4 20	10	8½	Warnboro' Sd., Australia, W. Coast.		3-4	
Veere, Netherlands -	1 20	15		Warrenpoint, Carlingford, Ireland.	11 10	14½	
Ventry, Ireland -	3 44	10½	7½	——— Lough Foyle, Ireland.	6 20	6½	
Venus Harbour, Australia, S. Coast.	2 15	6		Watch Hill, United States	9 0	3	
Vera Cruz, G. of Mexico		2					
Verde C., Africa, W. C.	7 45	5					
Vermilion Bay, G. of Mexico.	irr.	2½	1½				
Vernon Chan. (Chusan Arch), China, E. Coast	9 40	14					
Versavah, Hindoostan, W. Coast.	12 15	16					
Verte Bay, Nova Scotia	10 0	9	5				
Victoria, Brazil - -	3 0	4					
——— St. Juan de Fuca Strait.	irr.	7-10					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
rd (Bridge), Ire-	6 6	13½	10½	Wisbeach Eye, England		20	
ord (Duncannon	5 20	12½	10	Wivenhoe, Colne River, England.	12 10	15	10
to B., Africa, S. Cat.	4 0	6		Wolstenholm Sound, Arctic Regions.	11 8	7½	
lands, Tierra del	2 0	5		Woodbridge Haven (Bar), England.	11 45	12	9
—				— (Kingston Quay), England.	0 35	10	
—wei Harbour, New Sea.	9 30	9		Woodbridge, (Wilford Bridge), England.	0 55	7	
Lead, R. Tamar, and	6 17	5½	1½	Woodlark Id., Louisiade Archip.	7 15	4	
to B., Patagonia, Coast.	0 50	7½		Woods Hole (entrance from Vineyard Sound), United States.	8 34	2	1½
ey Is., Australia, East.	7 30	8-12		— (entrance from Buzzard Bay), United States.	7 59	11	4
st, United States	11 5	13½	12	Woolwich, England -	1 37	18½	15½
England -	7 0	12		Workington, England -	11 4	20	15
lar, England -	6 20	11		Wrabness, Stour River, England.	12 29	12	
n Isles, Galapagos (outer light vessel), any.	2 10			Wranger Oog, Germany	12 0	97	
ove, Kenmare R., and.	3 52	10	7½	Wrath Cape, Scotland -	7 30	15½	
st, Netherlands -	1 45	7		Wreck Reef, Australia, E. Coast.	8 45	6-8	
ill, Australia, E. C.	10 20	11		Wuchan, Si Kiang, China, East Coast.		1-1½	
Quoddy, Bay of Y.	11 12	21	17	Wusung River (entrance), Yang-tse-Kyang, China, E. Coast.	0 30	15	10½
river, China, E. t, see Si Kiang.				Wynkoops Bay, Java -	5 0	4½	4
a Port, Australia, East.	1 10	■	6	Yang-tse Kyang (entrance), China, E. Coast.	12 0	12	8
unshaven, Faeroe	8 0	9½	7½	Yarmouth Haven (Brush) England.		5½	4½
sa, Orkneys -	9 11	10	7½	— Bay of Fundy	10 9	16	13
super-mare, Eng-	6 54	37	28½	— Bridge, England		5	4
rt, Ireland -	4 57	12½	9½	— Road, England	9 15	6	4
rd, Ireland -	7 21	5	3½	— Isle of Wight, England.	10 0	7	6½
son { In March -	1 40	7-8		Yealm River, Bigbury Bay, England.	12 0	16½	11½
), { In April -	1 15			Yedo Bay, (Yoku-hama) Japan.	6 0	6½	4½
t { In May & June	0 30			Yellaboi, Africa, West Coast.	7 10	10	
t note, p. 168.				Yeu, Ile d', France -	3 6	14½	10
r, England -	3 45	15	11½	Ylo Road, Peru -	8 15	6	
ogida, China, E. C.	9 0	11		Yndependencia B., Peru	4 50	4	
aven, England -	11 14	23½	18½	Yoku-hama, Yedo Bay, Japan Sen.	6 0	6½	4½
— Nova Scotia	8 0	6½	4½	York C., Australia, East Coast.	11 15	10	7
Scotland -	11 22	10	7½	— Factory, Hudson Bay	11 15	10-14	
w, Ireland -	10 29	9	6½	— River (Moody's Wharf), United States.	9 35	3½	
ry, Australia, E. C.	9 0	6-8		— Road, Magellan St.	2 0	■	
all, Orkneys -	9 3	10	7½	Youghal, Ireland -	5 14	12½	10
l Ptt., Falkland Ids.	5 15	7	5½				
— New Zealand	12 45	8	6				
ghby Cape, Kan-	4 10	6					
Id., Australia.							
gton, United States	9 6	3	2½				
romontory, Aus-	2 0	10					
S. Coast.							
Harb., Melville Id.	1 30	3½					
n Ridge, England	7 50						
b, England -	7 30	15					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	
Yung R., Chinhac, China, E. Coast.	11 20	12½		Zanzibar, Africa, E.C. -	5 20	10	
——— Ning-po-fu, China, E. Coast.	1 0	9		——— (Channel)	4 15	11	
Yung-hing Bay, Japan S.	5 20	2½		Africa, E. Coast.			
Yura Harbour, Japan Sea	6 5	6½		Zebú Port, Filipinas -	12 0	7	
				Zeyla, Africa, E. Coast	7 15	8½	
				Zieriksee, Netherlands -	2 0	11	

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For Her Majesty's Stationery Office.

TIDE TABLES

FOR THE

BRITISH AND IRISH PORTS,

FOR THE YEAR

1864;

ALSO THE TIMES AND HEIGHTS OF HIGH WATER AT FULL AND CHANGE
FOR THE PRINCIPAL PLACES ON THE GLOBE.

COMPUTED BY JOHN BURDWOOD, STAFF COMMANDER, R.N.

PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.

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1863.



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	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
ST - <i>Page</i>	8	16	24	32	40	48	56	64	72	80	88	96
- - - "	2	10	18	26	34	42	50	58	66	74	82	90
PORT - - "	2	10	18	26	34	42	50	58	66	74	82	90
- - - "	3	11	19	27	35	43	51	59	67	75	83	91
AY - - - "	9	17	25	33	41	49	57	65	73	81	89	97
OCK - - "	6	14	22	30	38	46	54	62	70	78	86	94
ICH - - "	4	12	20	28	36	44	52	60	68	76	84	92
LEAD - - "	7	15	23	31	39	47	55	63	71	79	87	95
- - - - "	4	12	20	28	36	44	52	60	68	76	84	92
TOWN - - "	7	15	23	31	39	47	55	63	71	79	87	95
- - - - "	5	13	21	29	37	45	53	61	69	77	85	93
POOL - - "	6	14	22	30	38	46	54	62	70	78	86	94
N - - - - "	3	11	19	27	35	43	51	59	67	75	83	91
NDERRY - "	8	16	24	32	40	48	56	64	72	80	88	96
ROKE - - "	6	14	22	30	38	46	54	62	70	78	86	94
MOUTH - "	2	10	18	26	34	42	50	58	66	74	82	90
STOWN - "	9	17	25	33	41	49	57	65	73	81	89	97
NESS - - "	3	11	19	27	35	43	51	59	67	75	83	91
DS (NORTH) "	5	13	21	29	37	45	53	61	69	77	85	93
BAY - - - "	8	16	24	32	40	48	56	64	72	80	88	96
RLAND - - "	4	12	20	28	36	44	52	60	68	76	84	92
O - - - - "	5	13	21	29	37	45	53	61	69	77	85	93
RFORD - - "	9	17	25	33	41	49	57	65	73	81	89	97
N-SUPER-MARE	7	15	23	31	39	47	55	63	71	79	87	95

NOTICE.

If it be desired to reduce the Mean Time at any Place to that of Greenwich (or Railway) Time, (which latter is used in the Tide Tables, published in Liverpool and Glasgow,) the following correction must be applied to the Time given in these Tables :—

				Minutes.
Brest	-	-	-	+ 18
Devonport		-	-	+ 17
Portsmouth	-		+	+ 4
Dover	-	-	-	— 5
Sheerness		-	-	— 3
Harwich	-	-	-	— 5
Hull	-	-	-	+ 1
Sunderland		-	-	+ 5
North Shields		-	-	+ 6
Leith	-	-	-	+ 13
Thurso	-	-	-	+ 14
Greenock	-	-	-	+ 19
Liverpool		-	-	+ 12
Pembroke	-	-	-	+ 20
Weston-super-mare			-	+ 12
Holyhead		-	-	+ 18

For the Irish Ports, should Dublin Mean Time be required, the following correction must be applied to the time given in these Tables :—

				Minutes.
Kingstown	-	-	-	— 1
Belfast	-	-	-	— 2
Londonderry.	-	-	-	+ 4
Sligo	-	-	-	+ 9
Galway	-	-	-	+ 11
Queenstown (Cork)		-	-	+ 8
Waterford	-	-	-	+ 3

The above corrections are also given at the foot of each page under the place for which the times and heights of high water are predicted.

ADVERTISEMENT.

In the following Tables the time of High Water is given to *Mean* time at Place. Those who are desirous of knowing the *Apparent* time, (or that shown by the Sun,) at which High Water occurs, must apply the equation of time, by addition or subtraction, as directed for that purpose.

The height of the tide in these Tables is calculated from the mean level of the low water of ordinary springs, because the soundings expressed in most charts are reduced to that level. The height therefore which is given at each place is the actual rise of High water above the mean low-water level of spring-tides.

In the column of the Moon's transit, (m) stands for morning, and (a) for afternoon.

The Moon's age is given in days, and tenths of a day, from the time of her conjunction, or change; thus, it is New Moon on the 6th of April, at 1 h. 49 m. in the afternoon, and therefore, on the 7th of April, at noon, the moon being 22 h. 11 m. old, her age may be accounted as nine tenths of a day, and is expressed by 0.9.

The highest equinoctial tides take place, on the west coast of Ireland and on the south coast of England, three transits after the New and Full Moon, unless diverted by gales of wind or other extraordinary causes. Along the east coast of England, they take place four transits after the New and Full Moon. In the river Thames they occur five transits after the same epoch. These differences arise from the cause, that the same tide-wave which produces high water on the west coast of Ireland takes half a day in its progress from thence to the east coast of England, and a whole day before it arrives in the river Thames.

The time of high water at Brest is added for the benefit of vessels navigating the north coast of France and the adjacent sea.

Immediately after the Tide Tables, at page 98, will be found a convenient method of deducing, from them, the height of the tide at any intermediate hour, between high and low water.

The next Table, at page 101, shows the depths on the dock-sills at Falmouth, Devonport, Plymouth, Portsmouth, Sheerness, Chatham, Woolwich, Deptford, London, Hull, Middlesbrough, Hartlepool, Sunderland, Leith, Pembroke, Liverpool, Birkenhead, Dublin, and Londonderry.

In page 103 will be found a collection of Constant Differences, by which the time and height of high water at certain other ports may be approximately found. If the authorities at the different ports would transmit to the Admiralty six months' observations (at least) of the times and heights of high and low water, these Constants might be usefully increased.

In page 108 a description is given of the general set of the tides in the neighbourhood of several parts of the coast, including a full account of the streams among the Orkneys, and through the Pentland Firth, by Com. F. W. L. Thomas, R. N. And, the development, by Rear-Admiral F. W. Beechey, of the movement of the great tide-wave up the English and Irish Channels, and into the North Sea; to which has been added a description of the set of the tides in the vicinity of Rathlin Island on the north coast of Ireland by Richard Hoskyn, Staff Commander, R. N.

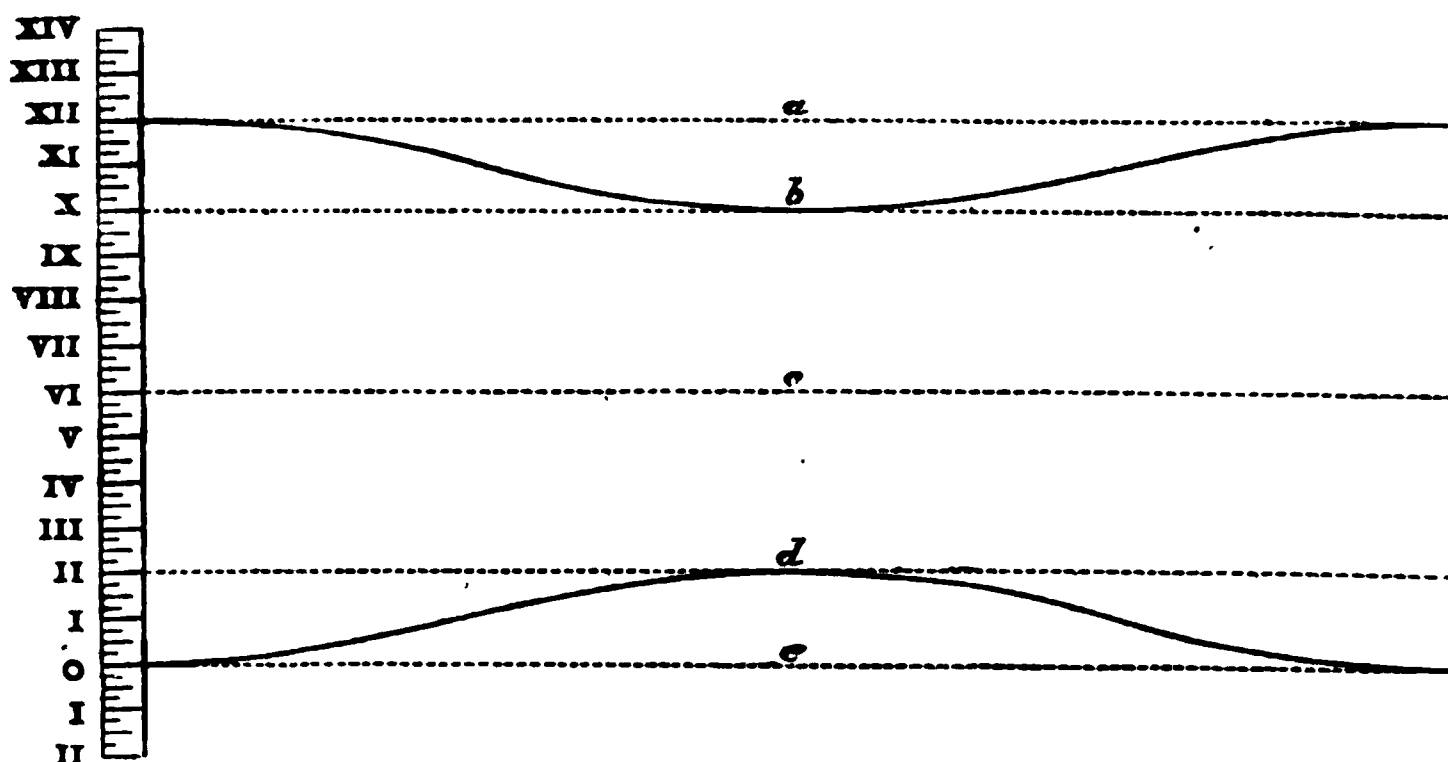
Lastly, there is appended the time of high water on the days of Full and Change at various places on the globe arranged according to the apparent progress of the tide-wave, and also alphabetically; with the rise of the tide at springs and neaps.

The stations at the several ports where the tidal observations were made on which the predictions in these tables are based, are as follows,—viz :—

Brest, entrance of the basin—Devonport, Dockyard—Portsmouth, Dockyard—Dover, North Pier—Sheerness, Dockyard—London Docks (reduced to London Bridge the latter being given in these tables, by applying to the times at the docks $+10^m$ to the heights -4^{ins})—Harwich, Angel Quay—Hull, Victoria Dock—Sunderland North Dock—North Shields, Low Lighthouse—Leith, East Pier—Thurso, 1 Scrabster Pier—Greenock, East Dock—Liverpool, St. Georges Pier—Pembroke Dockyard—Weston-super-mare, Bairnbach Island—Holyhead, Pier—Kingston Watering Pier—Belfast, New Dock—Londonderry, Ship Bridge—Sligo Bay, Malaghmore—Galway, Nimmos Pier—Queenstown, Scott's Wharf—Waterford, D cannon Fort.

The following diagram is intended to explain the terms Spring Rise, Neap Range and Neap Range as made use of on the Admiralty Charts and in the Sailing Directions published by the Admiralty :—

Tide Gauge.



- a = Mean Level of High Water Ordinary Springs.
 b = " " " Neaps.
 c = Half Tide or Mean Level of the sea both at Springs and Neaps.
 d = Mean Level of Low Water Ordinary Neaps.
 e = " " " Springs.

Example.

	ft.
Spring Rise (or Mean Spring Range) = e to a	= 12
Neap Rise = c to b	= 10
Neap Range = d to b	= 8

TIDE TABLES
FOR THE
BRITISH AND IRISH PORTS
FOR THE YEAR
1864.

TIDE TABLES FOR THE

JANUARY, 1864.

WEEK DAY.	MONTH DAY	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.								
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTER.						
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.					
		H. M.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.					
F.	1	5 m 4	7 51 15 1	8 12 14 8	9 28 12 11	9 49 12 4	3 31 11 0	3 49											
S.	2	5 47	8 37 14 3	9 3 14 0	10 11 12 6	10 37 12 1	4 9 10 8	4 34											
M.	3	6 33	9 34 13 10	10 10 13 10	11 3 12 2	11 34 12 0	4 59 10 3	5 28											
Tu.	4	7 22	10 47 13 11	11 25 14 1	—	—	0 14 12 2	6 2 10 1	6 36										
W.	5	8 15	—	0 3 14 6	0 52 12 3	1 30 12 6	7 14 10 2	7 50											
Th.	6	9 12	0 38 15 0	1 10 15 8	2 8 12 11	2 45 13 3	8 27 10 10	9 1											
F.	7	10 12	1 41 16 6	2 7 17 3	3 19 13 11	3 51 14 1	9 33 11 7	10 2											
S.	8	11 14	2 32 18 0	2 57 18 10	4 20 14 10	4 48 14 9	10 28 12 3	10 53											
M.	9	0 a 16	3 23 19 6	3 48 19 11	5 15 15 8	5 41 15 6	11 19 12 10	11 44											
Tu.	10	1 16	4 13 20 3	4 38 20 6	6 7 16 3	6 33 15 10	—	0 9											
W.	11	2 13	5 0 20 8	5 24 20 8	6 57 16 8	7 20 16 0	0 35 13 4	0 59											
Th.	12	3 7	5 47 20 5	6 10 20 1	7 43 16 7	8 6 15 9	1 24 13 5	1 48											
F.	13	3 59	6 33 19 8	6 56 19 2	8 30 16 2	8 52 15 3	2 11 13 2	2 34											
S.	14	4 50	7 18 18 4	7 41 17 6	9 11 15 5	9 31 14 7	2 57 12 8	3 19											
M.	15	5 40	8 5 16 8	8 30 15 11	9 53 14 6	10 15 13 9	3 41 12 1	4 3											
Tu.	16	6 30	8 56 15 2	9 24 14 6	10 39 13 5	11 4 13 0	4 27 11 4	4 53											
W.	17	7 20	9 58 14 2	10 38 13 10	11 32 12 7	—	5 19 10 6	5 51											
Th.	18	8 10	11 19 13 8	—	0 6 12 5	0 44 12 3	6 29 10 0	7 8											
F.	19	9 0	0 1 13 9	0 38 13 11	1 22 12 4	2 0 12 4	7 48 10 1	8 27											
S.	20	9 50	1 13 14 3	1 44 14 9	2 35 12 9	3 9 12 8	9 4 10 6	9 36											
M.	21	10 39	2 8 15 3	2 31 15 10	3 42 13 5	4 9 13 3	10 2 11 0	10 26											
Tu.	22	11 26	2 51 16 4	3 10 16 11	4 35 14 1	4 57 13 9	10 47 11 5	11 6											
W.	23	morn.	3 30 17 3	3 48 17 6	5 19 14 7	5 39 14 1	11 26 11 9	11 44											
Th.	24	0 12	4 4 17 9	4 21 17 11	5 56 14 11	6 14 14 8	12 0 12 0	—											
F.	25	0 55	4 37 18 1	4 52 18 2	6 31 15 2	6 48 14 6	0 17 12 1	0 34											
S.	26	1 38	5 7 18 3	5 22 18 2	7 3 15 2	7 16 14 5	0 51 12 2	1 7											
M.	27	2 20	5 38 18 1	5 52 17 11	7 31 14 11	7 46 14 3	1 23 12 2	1 38											
Tu.	28	3 2	6 8 17 9	6 23 17 7	8 0 14 6	8 16 13 11	1 53 12 1	2 8											
W.	29	3 45	6 40 17 2	6 58 16 9	8 33 14 1	8 47 13 7	2 24 11 11	2 41											
Th.	30	4 29	7 17 16 3	7 38 15 9	9 1 13 6	9 19 13 2	2 59 11 7	3 18											
F.	31	5 15	8 0 15 2	8 24 14 8	9 39 13 0	9 59 12 8	3 38 11 2	3 57											
Half Mean Spring Range.			9 ft. 6 in.				7 ft. 9 in.				6 ft. 4 in.								
Phases of the Moon.							Moon's Declination at Noon.												
							M.D.	°	'	M.D.	°	'	M.D.	°	'				
Last Quarter - 2 7 39 Morning.							1	49.22	9	17 8.42	17	17 N. 18	25						
New - - - - 9 7 46 Morning.							2	8 35	10	14 4	18	19 31	26						
First Quarter - 15 11 6 Afternoon.							3	12 23	11	9 32	19	20 45	27						
Full - - - - 23 10 2 Afternoon.							4	16 3	12	4 29	20	20 59	28						
							5	18 49	13	0 N. 42	21	20 14	29						
In Perigee - - 10 2 0 Morning.							6	20 34	14	5 42	22	18 35	30						
In Apogee - - 24 9 0 Afternoon.							7	21 3	15	10 16	23	16 8	31						
							8	20 5	16	14 11	24	13 2							

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required

Brest add 18 m.

Devonport add 17 m.

Portsmouth add 4 m.

JANUARY, 1864.

DOVER.				SHEERNESS.				LONDON.				C's Age at Noon.	
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.			
Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.		
3 13 16 2		3 30 15 10		4 43 14 2		5 3 14 0		6 15 17 4		6 34 17 12	11.7		
3 50 15 7		4 13 15 2		5 23 13 9		5 45 13 7		6 54 16 10		7 16 16 7	11		
4 37 14 10		5 4 14 7		6 12 13 4		6 41 13 2		7 40 16 5		8 8 16 2	23.7		
5 34 14 6		6 5 14 6		7 14 13 1		7 51 13 1		8 42 16 0		9 17 15 11	24.7		
6 40 14 9		7 16 15 1		8 28 13 2		9 5 13 5		9 53 15 11		10 30 16 1	25.7		
7 53 15 7		8 26 16 2		9 41 13 9		10 15 14 2		11 9 16 3		11 44 16 7	26.7		
8 56 16 9		9 25 17 4		10 45 14 6		11 15 14 11		—		0 15 17 0	27.7		
9 52 17 10		10 19 18 5		11 40 15 3		—		0 44 17 5		1 10 17 11	28.7		
10 47 18 11		11 15 19 3		0 5 15 8		0 30 16 1		1 37 18 4		2 2 18 10	●		
11 43 19 7		—		0 56 16 4		1 21 16 8		2 26 19 3		2 51 19 7	1.2		
0 9 19 10		0 34 20 0		1 45 16 10		2 9 16 11		3 15 19 11		3 39 20 1	2.2		
0 59 20 0		1 26 19 11		2 32 16 11		2 55 16 11		4 1 20 2		4 25 20 2	3.2		
1 50 19 8		2 14 19 4		3 17 16 10		3 40 16 7		4 50 20 1		5 12 19 10	4.2		
2 37 18 11		3 0 18 5		4 3 16 3		4 26 15 11		5 34 19 7		5 57 19 3	5.2		
3 22 17 9		3 44 17 2		4 49 15 6		5 11 15 1		6 19 18 10		6 42 18 4	6		
4 8 16 6		4 32 15 10		5 37 14 8		6 3 14 3		7 6 17 10		7 30 17 4	7.2		
4 56 15 3		5 25 14 9		6 32 13 10		7 3 13 5		7 59 16 11		8 32 16 6	8.2		
5 59 14 6		6 34 14 4		7 39 13 3		8 20 13 2		9 9 16 2		9 46 15 11	9.2		
7 14 14 6		7 53 14 9		9 0 13 2		9 39 13 4		10 25 15 10		11 4 15 10	10.2		
8 29 15 0		8 59 15 5		10 15 13 6		10 49 13 9		11 43 15 11		—	11.2		
9 25 15 9		9 49 16 2		11 18 14 0		11 42 14 3		0 15 16 1		0 44 16 4	12.2		
10 11 16 6		10 33 16 10		—		0 4 14 6		1 10 16 8		1 33 17 0	13.2		
10 54 17 1		11 14 17 4		0 24 14 9		0 43 14 11		1 55 17 3		2 14 17 7	○		
11 33 17 6		11 50 17 8		1 3 15 1		1 21 15 3		2 33 17 10		2 50 18 1	15.2		
—		0 7 17 10		1 37 15 5		1 53 15 6		3 6 18 3		3 23 18 5	16.2		
0 25 17 11		0 41 18 0		2 9 15 7		2 23 15 7		3 39 18 7		3 53 18 8	17.2		
0 58 18 0		1 15 18 0		2 39 15 7		2 54 15 7		4 9 18 8		4 24 18 8	18.2		
1 31 17 11		1 48 17 9		3 8 15 6		3 22 15 5		4 39 18 8		4 55 18 7	19.2		
2 4 17 8		2 22 17 5		3 37 15 3		3 53 15 1		5 11 18 5		5 26 18 3	20.2		
2 41 17 1		3 0 16 9		4 10 14 11		4 28 14 8		5 43 18 1		5 59 17 10	21.2		
3 19 16 4		3 38 15 11		4 48 14 4		5 8 14 1		6 18 17 7		6 37 17 3	22.2		
If Mean Spring } Range.				9ft. 4in.				8ft. 0in.				9ft. 7in.	

Equation of Time at Noon.

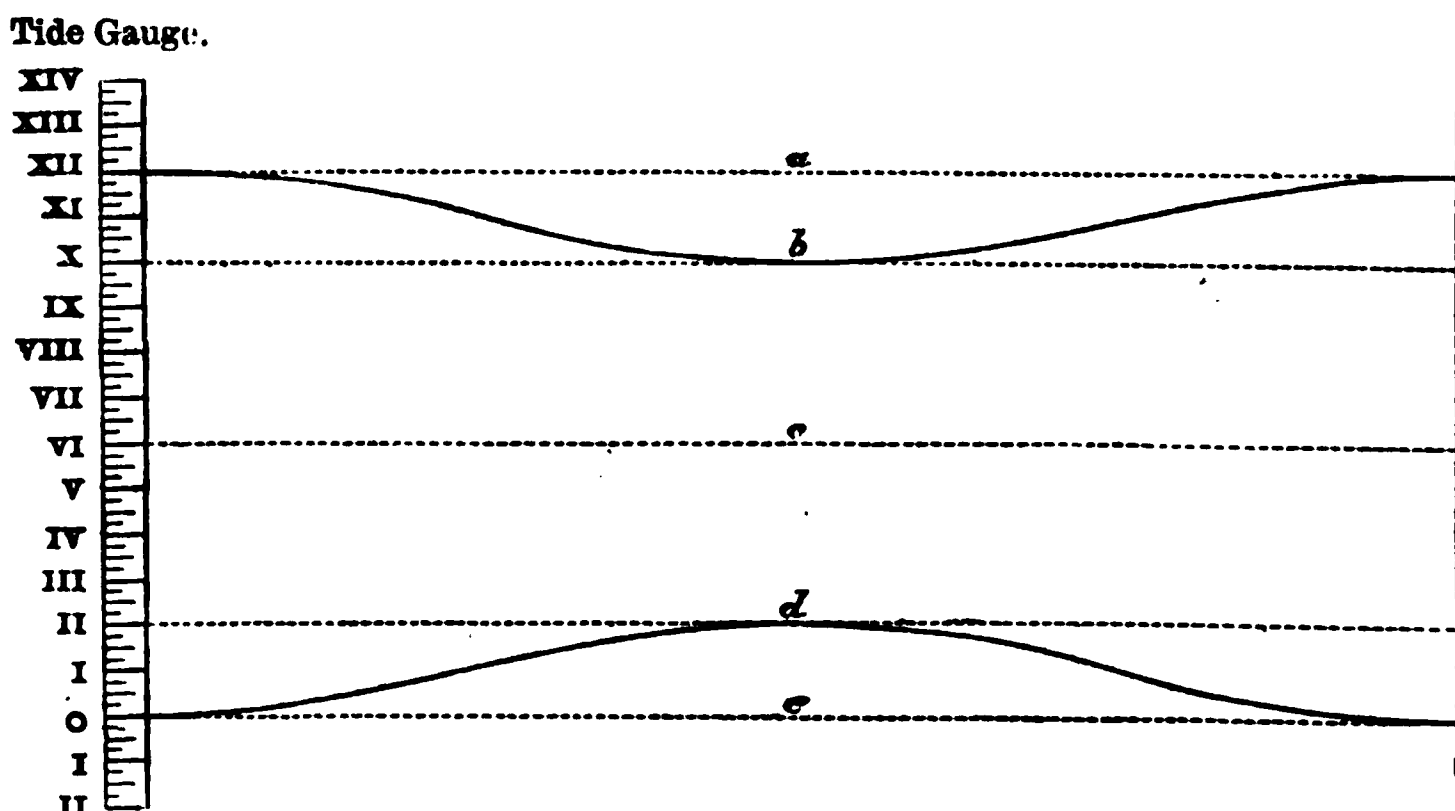
M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
3 38		9	7 14		17	10 16		25	12 32	
4 6		10	7 39		18	10 35		26	12 45	
4 34		11	8 3		19	10 54		27	12 58	
5 2		12	8 27		20	11 12		28	13 10	
5 29		13	8 50		21	11 30		29	13 21	
5 56		14	9 12		22	11 46		30	13 31	
6 22		15	9 34		23	12 2		31	13 41	
6 48		16	9 55		24	12 17				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 Dover subtract 5 m. SHEERNESS subtract 5 m. LONDON 0 m.

The stations at the several ports where the tidal observations were made on which the predictions in these tables are based, are as follows,—viz :—

Brest, entrance of the basin—Devonport, Dockyard—Portsmouth, Dockyard—Dover, North Pier—Sheerness, Dockyard—London Docks (reduced to London Bridge the latter being given in these tables, by applying to the times at the docks $+10^m$ to the heights -4^{ins})—Harwich, Angel Quay—Hull, Victoria Dock—Sunderland North Dock—North Shields, Low Lighthouse—Leith, East Pier—Thurso, n Scrabster Pier—Greenock, East Dock—Liverpool, St. Georges Pier—Pembroke Dockyard—Weston-super-mare, Bairnbach Island—Holyhead, Pier—Kingston Watering Pier—Belfast, New Dock—Londonderry, Ship Bridge—Sligo Bay, Malaghmore—Galway, Nimmos Pier—Queenstown, Scott's Wharf—Waterford, D cannon Fort.

The following diagram is intended to explain the terms Spring Rise, Neap R and Neap Range as made use of on the Admiralty Charts and in the Sailing Directions published by the Admiralty :—



- a = Mean Level of High Water Ordinary Springs.
 b = " " " Neaps.
 c = Half Tide or Mean Level of the sea both at Springs and Neaps.
 d = Mean Level of Low Water Ordinary Neaps.
 e = " " " Springs.

Example.

	ft.
Spring Rise (or Mean Spring Range) = e to a	12
Neap Rise = e to b	10
Neap Range = d to b	8

TIDE TABLES

FOR THE

BRITISH AND IRISH PORTS

FOR THE YEAR

1864.

JANUARY, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTER.			
			Time.	Height.	H.	M.	F.	L.	Time.	Height.	H.	M.	F.	L.	Time.	Height.	H.	M.	F.	L.	Time.	Height.	H.	M.	F.	L.
F.	1	5 m 4	3 55	8 11	4 13	8 9	3 5	22 0	3 24	21 7	10 11	17 3	10 30													
S.	2	5 47	4 34	8 8	4 58	8 7	3 45	21 2	4 12	20 9	10 51	16 4	11 13													
☾	3	6 33	5 24	8 5	5 54	8 4	4 40	20 4	5 14	20 1	11 40	15 8	—													
M.	4	7 22	6 28	8 3	7 2	8 3	5 51	20 1	6 30	20 3	0 10	15 7	0 43													
Tu.	5	8 15	7 39	8 3	8 15	8 5	7 9	20 8	7 44	21 2	1 23	15 10	2 4													
W.	6	9 12	8 50	8 7	9 23	8 10	8 19	21 10	8 48	22 7	2 42	16 10	3 18													
Th.	7	10 12	9 54	9 0	10 22	9 3	9 17	23 5	9 42	24 3	3 51	18 5	4 22													
F.	8	11 14	10 49	9 5	11 16	9 7	10 6	25 0	10 31	25 8	4 51	19 11	5 30													
S.	9	0 a 10	11 44	9 9	—	—	10 57	26 3	11 23	26 10	5 49	21 2	6 15													
☾	10	1 16	0 11	9 11	0 37	10 1	11 48	27 4	—	—	6 40	22 2	7 4													
M.	11	2 13	1 2	10 2	1 26	10 3	0 13	27 7	0 37	27 9	7 27	22 7	7 51													
Tu.	12	3 7	1 50	10 3	2 13	10 3	1 1	27 9	1 24	27 6	8 14	22 4	8 38													
W.	13	3 59	2 36	10 2	2 59	10 0	1 47	27 0	2 9	26 5	9 13	21 6	9 24													
Th.	14	4 50	3 21	9 10	3 42	9 8	2 31	25 9	2 53	25 1	9 44	20 3	10 4													
F.	15	5 40	4 4	9 6	4 27	9 3	3 15	24 3	3 38	23 5	10 25	18 10	10 47													
S.	16	6 30	4 52	9 1	5 17	8 10	4 3	22 6	4 32	21 8	11 9	17 2	11 32													
☾	17	7 20	5 44	8 7	6 17	8 5	5 2	20 11	5 39	20 6	—	—	0 1													
M.	18	8 10	6 55	8 3	7 33	8 2	6 21	20 2	7 3	20 1	0 36	15 7	1 16													
Tu.	19	9 0	8 13	8 2	8 50	8 3	7 42	20 3	8 19	20 7	2 1	15 6	2 42													
W.	20	9 50	9 26	8 5	9 57	8 6	8 52	21 0	9 21	21 6	3 20	16 1	3 53													
Th.	21	10 39	10 23	8 8	10 46	8 9	9 44	22 1	10 6	22 7	4 21	17 2	4 46													
F.	22	11 26	11 8	8 10	11 30	8 11	10 26	23 1	10 44	23 5	5 11	18 3	5 34													
S.	23	morn.	11 51	9 0	—	—	11 4	23 9	11 22	24 1	5 55	19 0	6 14													
☾	24	0 12	0 10	9 2	0 38	9 3	11 40	24 5	11 56	24 8	6 32	19 7	6 48													
M.	25	0 55	0 44	9 4	1 1	9 5	—	—	0 13	24 10	7 4	20 0	7 19													
Tu.	26	1 38	1 18	9 5	1 34	9 6	0 28	25 0	0 44	25 0	7 34	20 1	7 50													
W.	27	2 20	1 49	9 6	2 4	9 6	1 0	25 0	1 15	24 11	8 4	20 0	8 19													
Th.	28	3 2	2 18	9 6	2 34	9 5	1 29	24 8	1 44	24 5	8 35	19 8	8 51													
F.	29	3 45	2 50	9 4	3 7	9 3	1 59	24 1	2 16	23 9	9 8	19 1	9 25													
S.	30	4 29	3 23	9 2	3 47	9 1	2 34	23 3	2 52	22 10	9 43	18 3	10 1													
☾	31	5 15	4 2	8 11	4 21	8 10	3 12	22 3	3 32	21 8	10 19	17 4	10 41													
Half Mean Spring Range.			4 ft. 10 in.								13 ft. 0 in.								10 ft. 6 in.							
Phases of the Moon.												Moon's Declination at Noon.														
D H. M.												M.D. ° ' "														
Last Quarter - 2 7 39 Morning.												1 48.22 9 17 8.42 17 17 N. 18 25														
New - - - - 9 7 46 Morning.												2 8 55 10 14 4 18 19 31 26														
First Quarter - 15 11 6 Afternoon.												3 12 33 11 9 32 19 20 45 27														
Full - - - - 23 10 2 Afternoon.												4 16 3 12 4 29 20 20 59 28														
In Perigee - - 10 2 0 Morning.												5 18 49 13 0 N. 42 21 20 14 29														
In Apogee - - 24 9 0 Afternoon.												6 20 34 14 5 42 22 18 35 30 1														
												7 21 3 15 10 16 23 16 8 31 1														
												8 20 5 16 14 11 24 13 2														

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 GREENOCK add 19 m. | LIVERPOOL add 13 m. | PEMBROKE add 20 m.

BRITISH AND IRISH PORTS.

3

JANUARY, 1864.

DOVER.				SHEERNESS.				LONDON.				C's Age at Noon.	
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.			
Height. F. I.		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.		
3 16	2	3 30	15 10	4 43	14 2	5 3	14 0	6 15	17 4	6 34	17 1	21.7	
0 15	7	4 13	15 2	5 23	13 9	5 45	13 7	6 54	16 10	7 16	16 7	0	
7 14	10	5 4	14 7	6 12	13 4	6 41	13 2	7 40	16 5	8 8	16 2	23.7	
4 14	6	6 5	14 6	7 14	13 1	7 51	13 1	8 42	16 0	9 17	15 11	24.7	
0 14	9	7 16	15 1	8 28	13 2	9 5	13 5	9 53	15 11	10 30	16 1	25.7	
3 15	7	8 26	16 2	9 41	13 9	10 15	14 2	11 9	16 3	11 44	16 7	26.7	
6 16	9	9 25	17 4	10 45	14 6	11 15	14 11	—	—	0 15	17 0	27.7	
2 17	10	10 19	18 5	11 40	15 3	—	—	0 44	17 5	1 10	17 11	28.7	
7 18	11	11 15	19 3	0 5	15 8	0 30	16 1	1 37	18 4	2 2	18 10	0	
2 19	7	—	—	0 56	16 4	1 21	16 8	2 26	19 3	2 51	19 7	1.2	
9 19	10	0 34	20 0	1 45	16 10	2 9	16 11	3 15	19 11	3 39	20 1	2.2	
9 20	0	1 26	19 11	2 32	16 11	2 55	16 11	4 1	20 2	4 25	20 2	3.2	
0 19	8	2 14	19 4	3 17	16 10	3 40	16 7	4 50	20 1	5 12	19 10	4.2	
7 18	11	3 0	18 5	4 3	16 3	4 26	15 11	5 34	19 7	5 57	19 3	5.2	
12 17	9	3 44	17 2	4 49	15 6	5 11	15 1	6 19	18 10	6 42	18 4	6.2	
8 16	6	4 32	15 10	5 37	14 8	6 3	14 3	7 6	17 10	7 30	17 4	7.2	
56 15	3	5 25	14 9	6 32	13 10	7 3	13 5	7 59	16 11	8 32	16 6	8.2	
59 14	6	6 34	14 4	7 39	13 3	8 20	13 2	9 9	16 2	9 46	15 11	9.2	
14 14	6	7 53	14 9	9 0	13 2	9 39	13 4	10 25	15 10	11 4	15 10	10.2	
29 15	0	8 59	15 5	10 15	13 6	10 49	13 9	11 43	15 11	—	—	11.2	
25 15	9	9 49	16 2	11 18	14 0	11 42	14 3	0 15	16 1	0 44	16 4	12.2	
11 16	6	10 33	16 10	—	—	0 4	14 6	1 10	16 8	1 33	17 0	13.2	
54 17	1	11 14	17 4	0 24	14 9	0 43	14 11	1 55	17 3	2 14	17 7	0	
33 17	6	11 50	17 8	1 3	15 1	1 21	15 3	2 33	17 10	2 50	18 1	15.2	
—	—	0 7	17 10	1 37	15 5	1 53	15 6	3 6	18 3	3 23	18 5	16.2	
25 17	11	0 41	18 0	2 9	15 7	2 23	15 7	3 39	18 7	3 53	18 8	17.2	
58 18	0	1 15	18 0	2 39	15 7	2 54	15 7	4 9	18 8	4 24	18 8	18.2	
31 17	11	1 48	17 9	3 8	15 6	3 22	15 5	4 39	18 8	4 55	18 7	19.2	
4 17	8	2 22	17 5	3 37	15 3	3 53	15 1	5 11	18 5	5 26	18 3	20.2	
41 17	1	3 0	16 9	4 10	14 11	4 28	14 8	5 43	18 1	5 59	17 10	21.2	
19 16	4	3 38	15 11	4 48	14 4	5 8	14 1	6 18	17 7	6 37	17 3	22.2	
Mean Spring Tide.		9ft. 4in.		8ft. 0in.		9ft. 7in.							

Equation of Time at Noon.

M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
3 38		9	7 14		17	10 16		25	12 32	
4 6		10	7 39		18	10 35		26	12 45	
4 34		11	8 3		19	10 54		27	12 58	
5 2		12	8 27		20	11 12		28	13 10	
5 29		13	8 50		21	11 30		29	13 21	
5 56		14	9 12		22	11 46		30	13 31	
6 22		15	9 34		23	12 2		31	13 41	
6 48		16	9 55		24	12 17				

High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 Dover subtract 3 m. SHEERNESS subtract 3 m. LONDON 0 m.

TIDE TABLES FOR THE

JANUARY, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
			H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
F.	1	5m 4	2 49	8 6	3 9	8 5	—	—	0 19	5 10	9 32	8 9	9 57	—	
S.	2	5 47	3 32	8 4	3 59	■	3	0 48	5 8	1 23	5 7	10 27	■	6 10 57	
■	3	6 33	4 27	8 2	4 59	■	1	1 58	5 7	2 35	5 7	11 31	8 4	—	
M.	4	7 22	5 32	■	1	6 5	8 1	3 10	5 9	3 42	5 11	0 5	8 4	0 39	
Tu.	5	8 15	6 41	8 1	7 16	8 2	4 14	6 1	4 42	6 4	1 15	8 7	1 49	—	
W.	6	9 12	7 49	8 4	8 18	8 6	5 8	6 6	5 32	6 9	2 22	9 1	2 50	—	
Th.	7	10 12	8 46	8 9	9 12	9 0	5 57	6 11	6 22	7 2	3 17	9 10	3 41	—	
F.	8	11 14	9 37	9 3	10 2	9 5	6 47	7 5	7 14	7 7	4 4	10 7	4 28	—	
S.	9	0 16	10 27	9 7	10 52	9 8	7 41	7 10	8 6	8 0	4 54	11 4	5 20	—	
■	10	1 16	11 16	9 9	11 38	9 9	8 29	8 2	8 50	8 3	5 45	11 10	6 8	—	
M.	11	2 13	11 59	9 10	—	—	9 12	8 3	9 35	8 2	6 30	11 11	6 55	—	
Tu.	12	3 7	0 25	9 10	0 51	9 9	9 57	8 0	10 19	7 10	7 20	11 8	7 43	—	
W.	13	3 59	1 15	9 8	1 40	9 7	10 42	7 8	11 5	7 5	8 5	11 0	8 28	—	
Th.	14	4 50	2 6	9 5	2 32	9 3	11 30	7 1	12 0	6 9	8 52	10 4	9 16	—	
F.	15	5 40	2 57	9 1	3 23	8 10	—	—	0 32	6 5	9 46	9 7	10 15	—	
S.	16	6 30	3 50	■	4 19	8 6	1 7	6 2	1 44	6 0	10 47	8 11	11 20	—	
■	17	7 20	4 49	8 4	5 22	■	2	2 22	5 10	2 59	5 9	11 55	8 6	—	
Tu.	18	8 10	5 58	8 1	6 35	8 0	3 36	5 10	4 9	5 11	0 32	8 5	1 9	—	
W.	19	9 0	7 14	8 0	7 50	■	0	4 42	6 0	5 11	6 1	1 47	■	5 2 22	
Th.	20	9 50	8 23	■	8 51	8 4	5 38	6 3	6 3	6 4	2 55	8 8	3 22	—	
F.	21	10 39	9 14	8 6	9 36	8 8	6 25	6 6	6 46	6 8	3 44	9 3	4 3	—	
S.	22	11 26	9 56	8 10	10 15	■	11	7 7	6 9	7 27	6 11	4 22	9 9	4 41	
■	23	morn.	10 34	9 0	10 51	9 1	7 48	7 0	8 6	7 1	5 0	10 3	5 19	—	
Tu.	24	0 12	11 8	9 1	11 23	9 2	8 22	7 3	8 36	7 4	5 37	10 7	5 53	—	
W.	25	0 55	11 38	9 2	11 52	9 2	8 51	7 4	9 4	7 4	6 8	10 9	6 22	—	
Th.	26	1 38	—	—	0 7	9 2	9 19	7 3	9 34	7 3	6 37	10 9	6 53	—	
F.	27	2 20	0 24	9 2	0 40	9 2	9 48	7 2	10 1	7 1	7 9	10 6	7 24	—	
S.	28	3 2	0 56	9 2	1 13	9 1	10 16	6 11	10 32	6 10	7 40	10 2	7 56	—	
■	29	3 45	1 30	9 1	1 50	9 0	10 50	6 9	11 8	6 7	8 13	9 9	8 31	—	
Tu.	30	4 29	2 10	8 11	2 31	8 9	11 31	6 4	11 58	6 1	8 51	9 4	9 13	—	
W.	31	5 15	2 54	8 7	3 17	■	5	—	0 26	5 10	9 39	8 10	10 7	—	
Half Mean Spring Range.			4 ⁿ . 9 ⁱⁿ .				3 ⁿ . 10 ⁱⁿ .				5 ⁿ . 7 ⁱⁿ .				
Phases of the Moon.							Moon's Declination at Noon.								
			D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter -			2	7	39	Morning.	1	4	8.22	9	17	8.42	17	17	N.18
New - - - -			9	7	46	Morning.	2	8	35	10	14	4	18	19	31
First Quarter -			15	11	6	Afternoon.	3	12	33	11	9	32	19	20	45
Full - - - -			23	10	2	Afternoon.	4	16	3	12	4	29	20	20	59
							5	18	49	13	0	N.42	21	20	14
In Perigee - -			10	2	0	Morning.	6	20	34	14	5	42	■	18	35
In Apogee - -			24	9	0	Afternoon.	7	21	3	15	10	16	23	16	8
							8	20	5	16	14	11	24	13	2

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required
 BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

JANUARY, 1864.

NORTH SHIELDS.								LEITH.								THURSO.								C's AGE AT NOON.	
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.					
Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.				
H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.	
7 37 10 11	7 59 10 7	6 34 13 8	6 54 13 5	0 25 10 6	0 46 10 3	21.7																			
8 23 10 4	8 52 10 1	7 18 13 2	7 47 12 11	1 9 10 1	1 37 9 10	(
9 22 10 0	9 57 9 11	8 16 12 9	8 50 12 7	2 7 9 8	2 42 9 6	23.7																			
10 33 10 0	11 8 10 1	9 27 12 7	10 2 12 8	3 21 9 6	4 0 9 6	24.7																			
11 43 10 4	— —	10 36 12 11	11 9 13 2	4 36 9 8	5 11 9 10	25.7																			
0 16 10 7	0 47 10 11	11 41 13 6	— —	5 43 10 2	6 12 10 8	26.7																			
1 16 11 3	1 43 11 8	0 10 14 0	0 37 14 6	6 38 11 3	7 1 11 11	27.7																			
2 8 12 1	2 32 12 7	1 2 15 0	1 27 15 7	7 22 12 6	7 43 13 1	28.7																			
3 56 13 0	3 20 13 5	1 53 16 2	2 18 16 7	8 6 13 7	8 30 13 11	●																			
4 34 13 9	4 9 14 0	2 43 16 11	3 6 17 2	8 54 14 1	9 17 14 3	1.2																			
5 33 14 1	4 57 14 1	3 28 17 3	3 51 17 3	9 41 14 3	10 6 14 2	2.2																			
6 21 14 0	5 46 13 10	4 16 17 2	4 41 17 0	10 31 13 11	10 55 13 8	3.2																			
7 10 13 7	6 34 13 4	5 5 16 9	5 29 16 5	11 20 13 3	11 45 12 10	4.2																			
8 58 13 0	7 21 12 7	5 53 16 0	6 17 15 7	— —	0 9 12 5	5.2																			
9 45 12 2	8 13 11 8	6 42 15 0	7 8 14 6	0 33 11 10	1 0 11 4	6.2																			
0 41 11 1	9 12 10 8	7 36 14 0	8 7 13 6	1 27 10 11	1 57 10 5	7.2																			
1 45 10 4	10 22 10 2	8 38 13 1	9 15 12 10	2 29 10 0	3 7 9 9	8.2																			
2 0 10 0	11 37 10 0	9 55 12 8	10 32 12 7	3 51 9 6	4 30 9 4	9.2																			
3 — —	0 15 10 1	11 8 12 8	11 42 12 10	5 9 9 4	5 44 9 5	10.2																			
4 49 10 3	1 20 10 5	— —	0 15 13 0	6 16 9 8	6 44 10 1	11.2																			
5 48 10 8	2 10 10 11	0 42 13 4	1 4 13 8	7 4 10 6	7 23 10 11	12.2																			
6 31 11 3	2 51 11 7	1 26 14 1	1 47 14 5	7 40 11 4	7 57 11 9	13.2																			
7 9 11 10	3 27 12 0	2 6 14 9	2 25 15 0	8 14 12 0	8 31 12 3	14.2																			
8 34 12 3	4 0 12 5	2 43 15 3	2 59 15 5	8 47 12 5	9 1 12 6	15.2																			
9 16 12 6	4 32 12 8	3 13 15 6	3 28 15 7	9 17 12 7	9 33 12 7	16.2																			
0 48 12 7	5 4 12 7	3 44 15 7	3 59 15 7	9 49 12 7	10 5 12 6	17.2																			
1 20 12 6	5 36 12 5	4 15 15 6	4 30 15 5	10 20 12 5	10 36 12 3	18.2																			
2 51 12 4	6 8 12 2	4 46 15 3	5 2 15 2	10 52 12 1	11 9 11 10	19.2																			
3 25 12 1	6 42 11 11	5 19 15 0	5 37 14 9	11 28 11 7	11 48 11 4	20.2																			
4 0 11 8	7 20 11 5	5 56 14 6	6 17 14 2	— —	0 9 11 0	21.2																			
5 42 11 1	8 7 10 8	6 39 13 10	7 2 13 6	0 30 10 8	0 54 10 4	22.2																			
If Mean Spring } 6ft. 8in. Range.								8ft. 2in.								6ft. 7in.									

Equation of Time at Noon.

M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
3	38		9	7	14		17	10	16		25	12	32	
4	6		10	7	39		18	10	35		26	12	45	
4	34		11	8	3		19	10	54		27	12	58	
5	2		12	8	27		20	11	12		28	13	10	
5	29		13	8	50		21	11	30		29	13	21	
5	56		14	9	12		22	11	46		30	13	31	
6	22		15	9	34		23	12	2		31	13	41	
6	48		16	9	55		24	12	17					

nes of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 8 m. | LEITH add 18 m. | THURSO add 14 m.

JANUARY, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.								
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.											
			H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.												
F.	1	5 m 4	3 55	8 11	4 13	8 9	3 52	22 0	3 24	21 7	10 11	17 3	10 30	16 1																	
S.	2	5 47	4 34	8 8	4 58	8 7	3 45	21 2	4 12	20 9	10 51	16 4	11 13	16 5																	
S.	3	6 33	5 24	8 5	5 54	8 4	4 40	20 4	5 14	20 1	11 40	15 8	—	—																	
M.	4	7 22	6 28	8 3	7 2	8 3	5 51	20 1	6 30	20 3	0 10	15 7	0 43	15 5																	
Tu.	5	8 15	7 39	8 3	8 15	8 5	7 9	20 8	7 44	21 1	1 23	15 10	2 4	16 5																	
W.	6	9 12	8 50	8 7	9 23	8 10	8 19	21 10	8 48	22 7	2 42	16 10	3 18	17 5																	
Th.	7	10 12	9 54	9 0	10 22	9 3	9 17	23 5	9 42	24 3	3 51	18 5	4 22	19 5																	
F.	8	11 14	10 49	9 5	11 16	9 7	10 6	25 0	10 31	25 1	4 51	19 11	5 20	20 5																	
S.	9	0 10	11 44	9 9	—	—	10 57	26 3	11 23	26 10	5 49	21 2	6 15	21 5																	
S.	10	1 16	0 11	9 11	0 37	10 11	11 48	27 4	—	—	6 40	22 2	7 42	22 5																	
M.	11	2 13	1 2	10 2	1 26	10 3	0 13	27 7	0 37	27 9	7 27	22 7	7 51	22 5																	
Tu.	12	3 7	1 50	10 3	2 13	10 3	1 13	27 9	1 24	27 6	8 14	22 4	8 38	22 5																	
W.	13	3 59	2 36	10 2	2 59	10 0	1 47	27 0	2 9	26 5	9 12	21 6	9 24	20 5																	
Th.	14	4 50	3 21	9 10	3 42	9 8	2 31	25 9	2 53	25 1	9 44	20 3	10 4	19 5																	
F.	15	5 40	4 4	9 6	4 27	9 3	3 15	24 3	3 38	23 5	10 25	18 10	10 47	18 5																	
S.	16	6 30	4 52	9 1	5 17	8 10	4 3	22 6	4 32	21 1	11 9	17 2	11 32	16 5																	
S.	17	7 20	5 44	8 7	6 17	8 5	5 2	20 11	5 39	20 6	—	—	0 1	15 5																	
M.	18	8 10	6 55	8 3	7 33	8 2	6 21	20 2	7 3	—	0 36	15 7	1 16	15 5																	
Tu.	19	9 0	8 13	8 2	8 50	8 3	7 42	20 3	8 19	20 7	2 1	15 6	2 42	15 5																	
W.	20	9 50	9 26	8 5	9 57	8 6	8 52	21 0	9 21	21 6	3 20	16 1	3 53	16 5																	
Th.	21	10 39	10 23	8 8	10 46	8 9	9 44	22 1	10 6	22 7	4 21	17 2	4 46	17 5																	
F.	22	11 26	11 8	8 10	11 30	8 11	10 26	23 1	10 44	23 5	5 11	18 3	5 34	18 5																	
S.	23	morn.	11 51	9 0	—	—	11 4	23 9	11 22	24 1	5 55	19 0	6 14	19 5																	
S.	24	0 12	0 10	9 2	0 28	9 3	11 40	24 5	11 56	24 8	6 32	19 7	6 48	19 5																	
M.	25	0 55	0 44	9 4	1 1	9 5	—	—	0 13	24 10	7 4	20 0	7 19	20 5																	
Tu.	26	1 38	1 18	9 5	1 34	9 6	0 28	25 0	0 44	25 0	7 34	20 1	7 50	20 5																	
W.	27	2 20	1 49	9 6	2 4	9 6	1 0	25 0	1 15	24 11	8 4	20 0	8 19	19 5																	
Th.	28	3 2	2 18	9 6	2 34	9 5	1 29	24 8	1 44	24 5	8 35	19 8	8 51	19 5																	
F.	29	3 45	2 50	9 4	3 7	9 3	1 59	24 1	2 16	23 9	9 8	19 1	9 25	18 5																	
S.	30	4 29	3 23	9 2	3 47	9 1	2 34	23 3	2 52	22 10	9 43	18 3	10 1	17 5																	
S.	31	5 15	4 2	8 11	4 21	8 10	3 12	22 3	3 32	21 8	10 19	17 4	10 41	16 5																	
Half Mean Spring Range.			4 ^{ft.} 10 ^{in.}								13 ^{ft.} 0 ^{in.}								10 ^{ft.} 6 ^{in.}												
Phases of the Moon.																Moon's Declination at Noon.															
D H. M.																M.D. ° ' "				M.D. ° ' "				M.D. ° ' "				M.D. ° ' "			
Last Quarter - 2 7 39 Morning.																1 48.22				9 17 8.42				17 17 N. 18				25 9 5.26			
New - - - - 9 7 46 Morning.																2 8 35				10 14 4				18 19 31				26 5 26			
First Quarter - 15 11 6 Afternoon.																3 12 33				11 9 32				19 20 45				27 1 16			
Full - - - - 23 10 2 Afternoon.																4 16 3				12 4 29				20 20 59				28 3 8			
																5 18 49				13 0 N. 42				21 20 14				29 7 1			
In Perigee - - 10 2 0 Morning.																6 20 34				14 5 42				22 18 35				30 11 8			
In Apogee - - 24 9 0 Afternoon.																7 21 3				15 10 16				23 16 8				31 14 4			
																8 20 5				16 14 11				24 13 2							

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 GREENOCK add 10 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

BRITISH AND IRISH PORTS.

7

JANUARY, 1864.

Month Day.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's Age at Noon.	
	Morning.		Afternoon.		Morning.		Afternoon.		Morning.		Afternoon.			
	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.		
1	10 39 31	5	10 57 30	9	2 7 13	7	2 28 13	4	3 6 9	6	3 26 9	4	21.7	
2	11 19 30	0	11 44 29	5	2 50 13	1	3 18 12	11	3 48 9	2	4 17 9	0	(
3	—	—	0 14 28	11	3 48 12	9	4 23 12	7	4 46 8	11	5 18 8	10	23.7	
4	0 47 28	9	1 22 28	10	5 0 12	8	5 35 12	9	5 51 8	10	6 24 8	11	24.7	
5	1 59 29	2	2 37 29	9	6 10 13	0	6 43 13	3	6 57 9	1	7 30 9	3	25.7	
6	3 15 30	7	3 53 31	8	7 15 13	7	7 44 14	0	8 3 9	6	8 35 9	9	26.7	
7	4 29 32	10	5 3 34	2	8 13 14	6	8 38 14	11	9 7 10	0	9 36 10	3	27.7	
8	5 32 35	4	6 1 36	6	9 2 15	5	9 26 15	10	10 1 10	6	10 25 10	10	28.7	
9	6 30 37	6	6 57 38	3	9 51 16	3	10 16 16	6	10 49 11	1	11 13 11	3	●	
10	7 23 39	1	7 48 39	7	10 39 16	10	11 0 17	0	11 37 11	5	—	—	1.2	
11	8 11 39	10	8 34 39	11	11 21 17	0	11 46 17	0	0 1 11	6	0 25 11	6	2.2	
12	8 56 39	8	9 18 39	3	—	—	0 11 16	10	0 50 11	5	1 15 11	4	3.2	
13	9 39 38	6	9 59 37	7	0 36 16	7	1 2 16	3	1 39 11	2	2 3 10	11	4.2	
14	10 18 36	6	10 35 35	3	1 27 15	10	1 51 15	5	2 27 10	8	2 51 10	5	5.2	
15	10 54 34	0	11 15 32	8	2 15 14	11	2 41 14	5	3 15 10	2	3 40 9	11)	
16	11 38 31	4	—	—	3 8 13	11	3 38 13	6	4 6 9	8	4 37 9	4	7.2	
17	0 4 30	3	0 37 29	4	4 10 13	1	4 48 12	10	5 8 9	1	5 41 8	11	8.2	
18	1 14 28	9	1 54 28	6	5 28 12	8	6 5 12	8	6 17 8	11	6 53 8	11	9.2	
19	2 35 28	7	3 15 28	10	6 42 12	9	7 16 12	10	7 29 9	0	8 4 9	1	10.2	
20	3 54 29	4	4 30 30	1	7 48 13	1	8 17 13	4	8 38 9	3	9 9 9	4	11.2	
21	5 0 30	11	5 27 31	10	8 40 13	8	9 1 14	0	9 36 9	6	10 0 9	9	12.2	
22	5 52 32	8	6 15 33	4	9 20 14	3	9 39 14	6	10 20 9	11	10 38 10	1	13.2	
23	6 36 33	10	6 56 34	4	9 58 14	8	10 16 14	11	10 56 10	3	11 13 10	4	○	
24	7 14 34	9	7 31 35	3	10 32 15	1	10 46 15	2	11 29 10	6	11 44 10	7	15.2	
25	7 47 35	8	8 2 35	9	11 0 15	4	11 14 15	4	12 0 10	7	—	—	16.2	
26	8 18 35	11	8 33 35	11	11 29 15	4	11 45 15	4	0 17 10	7	0 32 10	7	17.2	
27	8 47 35	10	9 1 35	8	—	—	0 1 15	3	0 49 10	6	1 4 10	5	18.2	
28	9 15 35	5	9 30 35	2	0 17 15	2	0 34 15	0	1 20 10	4	1 36 10	3	19.2	
29	9 45 34	7	10 0 34	0	0 52 14	10	1 11 14	7	1 53 10	2	2 11 10	0	20.2	
30	10 15 33	3	10 31 32	5	1 30 14	4	1 50 14	0	2 30 9	10	2 50 9	9	21.2	
31	10 48 31	7	11 8 30	9	2 12 13	9	2 35 13	5	3 11 9	7	3 34 9	5	22.2	
Half Mean Spring Range.				18ft. 7in.	8ft. 0in.				5ft. 6in.					

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	3 38	Sub.	9	7 14	Sub.	17	10 16	Sub.	25	12 32	Sub.
2	4 6		10	7 39		18	10 35		26	12 45	
3	4 34		11	8 3		19	10 54		27	12 58	
4	5 2		12	8 27		20	11 12		28	13 10	
5	5 29		13	8 50		21	11 30		29	13 21	
6	5 56		14	9 12		22	11 46		30	13 31	
7	6 22		15	6 34		23	12 2		31	13 41	
8	6 48		16	9 55		24	12 17				

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

JANUARY, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.
F.	1	5m 4	2 49	8 6	3 9	8 5	—	—	0 19	5 10	9 32	8 9	9 57	8
S.	2	5 47	3 32	8 4	3 59	8 3	0 48	5 8	1 23	5 7	10 27	8 6	10 57	8
S.	3	6 33	4 27	8 2	4 59	8 1	1 58	5 7	2 35	5 7	11 31	8 4	—	—
M.	4	7 22	5 32	8 1	6 5	8 1	3 10	5 9	3 42	5 11	0 5	8 4	0 39	8
Tu.	5	8 15	6 41	8 1	7 16	8 2	4 14	6 1	4 42	6 4	1 15	8 7	1 49	8
W.	6	9 12	7 49	8 4	8 18	8 6	5 8	6 6	5 32	6 9	2 22	9 2	2 50	9
Th.	7	10 12	8 46	8 9	9 12	9 0	5 57	6 11	6 22	7 2	3 17	9 10	3 41	10
F.	8	11 14	9 37	9 3	10 2	9 5	6 47	7 5	7 14	7 7	4 4	10 7	4 28	11
S.	9	0 16	10 27	9 7	10 52	9 8	7 41	7 10	8 6	8 0	4 54	11 4	5 20	11
S.	10	1 16	11 16	9 9	11 38	9 9	8 29	8 2	8 50	8 3	5 45	11 10	6 8	11
M.	11	2 13	11 59	9 10	—	—	9 12	8 3	9 35	8 2	6 30	11 11	6 55	11
Tu.	12	3 7	0 25	9 10	0 51	9 9	9 57	8 0	10 19	7 10	7 20	11 8	7 43	11
W.	13	3 59	1 15	9 8	1 40	9 7	10 42	7 8	11 5	7 5	8 5	11 0	8 28	10
Th.	14	4 50	2 6	9 5	2 32	9 3	11 30	7 1	12 0	6 9	8 52	10 4	9 16	9
F.	15	5 40	2 57	9 1	3 23	8 10	—	—	0 32	6 5	9 46	9 7	10 15	9
S.	16	6 30	3 50	8 8	4 19	8 6	1 7	6 2	1 44	6 0	10 47	8 11	11 20	8
S.	17	7 20	4 49	8 4	5 22	8 2	2 22	5 10	2 59	5 9	11 55	8 6	—	—
M.	18	8 10	5 58	8 1	6 35	8 0	3 36	5 10	4 9	5 11	0 32	8 5	1 9	8
Tu.	19	9 0	7 14	8 0	7 50	8 0	4 42	6 0	5 11	6 1	1 47	8 5	2 22	8
W.	20	9 50	8 23	8 2	8 51	8 4	5 38	6 3	6 3	6 4	2 55	8 8	3 22	8
Th.	21	10 39	9 14	8 6	9 36	8 8	6 25	6 6	6 46	6 8	3 44	9 3	4 3	9
F.	22	11 26	9 56	8 10	10 15	8 11	7 7	6 9	7 27	6 11	4 22	9 9	4 41	10
S.	23	morn.	10 34	9 0	10 51	9 1	7 48	7 0	8 6	7 1	5 0	10 3	5 19	10
S.	24	0 12	11 8	9 1	11 23	9 2	8 22	7 3	8 36	7 4	5 37	10 7	5 53	10
M.	25	0 55	11 38	9 2	11 52	9 2	8 51	7 4	9 4	7 4	6 8	10 9	6 22	10
Tu.	26	1 38	—	—	0 7	9 2	9 19	7 3	9 34	7 3	6 37	10 9	6 53	10
W.	27	2 20	0 24	9 2	0 40	9 2	9 48	7 2	10 1	7 1	7 9	10 6	7 24	10
Th.	28	3 2	0 56	9 2	1 13	9 1	10 16	6 11	10 32	6 10	7 40	10 2	7 56	10
F.	29	3 45	1 30	9 1	1 50	9 0	10 50	6 9	11 8	6 7	8 13	9 9	8 31	9
S.	30	4 29	2 10	8 11	2 31	8 9	11 31	6 4	11 58	6 1	8 51	9 4	9 13	9
S.	31	5 15	2 54	8 7	3 17	8 5	—	—	0 26	5 10	9 39	8 10	10 7	8
Half Mean Spring Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.			
Phases of the Moon.							Moon's Declination at Noon.							
			D. H. M.				M.D. ° ' "				M.D. ° ' "			
Last Quarter -			2	7	39	Morning.	1	4	8.22	9	17	8.42	17	17 N. 18
New - - - -			9	7	46	Morning.	2	8	35	10	14	4	18	19 31
First Quarter -			15	11	6	Afternoon.	3	12	33	11	9	32	19	20 45
Full - - - -			23	10	2	Afternoon.	4	16	3	12	4	29	20	20 59
							5	18	49	13	0	N. 42	21	20 14
In Perigee - -			10	2	0	Morning.	6	20	34	14	5	42	22	18 35
In Apogee - -			24	9	0	Afternoon.	7	21	3	15	10	16	23	16 8
							8	20	5	16	14	11	24	13 2

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—

BELFAST subtract 2 m.

LONDONDERRY add 4 m.

SLIGO BAY add 9 m.

JANUARY, 1864.

GALWAY.				QUEENSTOWN.				WATERFORD.				U's Age at Noon.	
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.			
Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.		
1	8 51 11 9	9 12 11 5	9 3 9 10	9 22 9 8	9 17 10 10	9 36 10 8	21.7						
2	9 38 11 2	10 6 10 11	9 44 9 5	10 8 9 3	10 1 10 5	10 29 10 2	(
3	10 39 10 10	11 15 10 11	10 38 9 2	11 13 9 2	11 0 10 0	11 32 9 11	23.7						
4	11 51 11 0	—	11 48 9 2	—	—	0 4 9 10	24.7						
5	0 27 11 2	1 1 11 6	0 24 9 3	1 1 9 6	0 38 10 0	1 12 10 3	25.7						
6	1 33 11 11	2 2 12 5	1 39 9 9	2 14 10 0	1 47 10 6	2 24 10 10	26.7						
7	2 31 12 11	2 58 13 5	2 46 10 5	3 16 10 9	2 59 11 2	3 32 11 7	27.7						
8	3 24 13 11	3 49 14 5	3 43 11 2	4 10 11 6	4 2 11 11	4 31 12 3	28.7						
9	4 14 14 11	4 39 15 4	4 37 11 10	5 3 12 1	5 0 12 6	5 26 12 9	●						
10	5 3 15 8	5 28 15 11	5 29 12 4	5 55 12 6	5 51 13 0	6 15 13 2	1.2						
11	5 52 16 0	6 16 15 11	6 19 12 7	6 42 12 7	6 39 13 3	7 3 13 3	2.2						
12	6 40 15 9	7 4 15 6	7 6 12 5	7 29 12 3	7 27 13 2	7 50 13 1	3.2						
13	7 28 15 1	7 52 14 8	7 52 12 0	8 14 11 8	8 12 12 11	8 33 12 8	4.2						
14	8 16 14 2	8 39 13 7	8 35 11 4	8 54 11 0	8 53 12 4	9 12 12 0	5.2						
15	9 4 12 11	9 30 12 4	9 17 10 7	9 40 10 3	9 32 11 8	9 54 11 3)						
16	9 58 11 9	10 28 11 4	10 3 9 11	10 28 9 7	10 21 10 10	10 51 10 5	7.2						
17	11 3 11 1	11 43 10 11	11 2 9 4	11 40 9 2	11 23 10 2	11 58 9 11	8.2						
18	—	0 21 10 10	—	0 19 9 0	—	0 33 9 9	9.2						
19	0 59 10 11	1 34 11 1	0 59 9 1	1 38 9 2	1 10 9 10	1 47 9 11	10.2						
20	2 6 11 4	2 34 11 8	2 16 9 4	2 49 9 7	2 25 10 1	3 0 10 4	11.2						
21	2 58 12 0	3 22 12 4	3 15 9 10	3 40 10 1	3 30 10 7	3 56 10 10	12.2						
22	3 42 12 8	4 1 12 11	4 2 10 4	4 24 10 7	4 21 11 1	4 44 11 3	13.2						
23	4 21 13 3	4 39 13 6	4 44 10 9	5 2 10 11	5 6 11 5	5 25 11 7	○						
24	4 55 13 9	5 11 13 11	5 20 11 1	5 37 11 2	5 43 11 8	5 58 11 9	15.2						
25	5 27 14 1	5 43 14 2	5 54 11 3	6 10 11 3	6 14 11 11	6 30 12 0	16.2						
26	5 59 14 2	6 15 14 1	6 26 11 4	6 41 11 4	6 46 12 0	7 2 12 0	17.2						
27	6 30 14 0	6 45 13 11	6 56 11 3	7 11 11 2	7 18 12 0	7 32 12 0	18.2						
28	7 1 13 9	7 18 13 7	7 27 11 1	7 43 10 11	7 47 11 11	8 3 11 10	19.2						
29	7 36 13 4	7 55 13 0	8 0 10 9	8 16 10 7	8 19 11 9	8 34 11 7	20.2						
30	8 15 12 8	8 36 12 3	8 33 10 5	8 51 10 2	8 51 11 4	9 8 11 2	21.2						
31	8 59 11 10	9 23 11 5	9 11 9 10	9 33 9 8	9 26 10 11	9 47 10 8	22.2						
Half Mean Spring Range. } 7ft. 5in.				5ft. 10in.				6ft. 2in.					

Equation of Time at Noon.

M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
3	38		9	7	14		17	10	16		25	12	32	
4	6		10	7	39		18	10	35		26	12	45	
4	34		11	8	3		19	10	54		27	12	58	
5	2		12	8	27		20	11	12		28	13	10	
5	29		13	8	50		21	11	30		29	13	21	
5	56		14	9	12		22	11	46		30	13	31	
6	22		15	9	34		23	12	2		31	13	41	
6	48		16	9	55		24	12	17					

Times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for

GALWAY add 11 m.

QUEENSTOWN add 8 m.

WATERFORD add 5 m.

FEBRUARY, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.
M.	1	6m 4	8 48	14 2	9 17	13 10	10 23	12 6	10 51	12 4	4 20	10 8	4 45	10 4
Tu.	2	6 58	9 54	13 9	10 36	13 9	11 21	12 2	11 58	12 3	5 13	10 2	5 47	10 4
W.	3	7 54	11 21	13 11	—	—	—	—	0 41	12 1	6 27	10 0	7 10	10 4
Th.	4	8 53	0 6	14 4	0 45	15 0	1 24	12 8	2 8	12 8	7 53	10 4	8 34	10 4
F.	5	9 54	1 21	15 10	1 53	16 9	2 48	13 7	3 26	13 7	9 12	11 3	9 45	11 3
S.	6	10 55	2 20	17 9	2 45	18 9	4 0	14 9	4 31	14 7	10 15	12 2	10 41	12 2
	7	11 54	3 10	19 7	3 34	20 4	5 0	15 9	5 28	15 6	11 6	12 11	11 30	13 1
M.	8	0 51	3 57	20 9	4 21	21 1	5 53	16 6	6 19	16 0	11 53	13 6	—	—
Tu.	9	1 46	4 44	21 4	5 5	21 3	6 43	16 11	7 6	16 4	0 17	13 8	0 42	13 1
W.	10	2 39	5 27	21 1	5 48	20 9	7 27	16 10	7 48	16 2	1 5	13 8	1 28	13 1
Th.	11	3 31	6 9	20 3	6 30	19 9	8 9	16 5	8 30	15 8	1 50	13 5	2 10	13 1
F.	12	4 23	6 51	19 0	7 11	18 1	8 50	15 7	9 7	14 11	2 31	13 0	2 53	13 1
S.	13	5 14	7 33	17 2	7 56	16 2	9 25	14 7	9 45	14 0	3 13	12 3	3 33	12 2
	14	6 6	8 19	15 3	8 46	14 4	10 6	13 6	10 27	13 0	3 55	11 5	4 17	11 1
M.	15	6 57	9 17	13 8	9 55	13 2	10 54	12 6	11 21	12 3	4 43	10 6	5 12	10 1
Tu.	16	7 47	10 38	12 11	11 21	12 10	11 56	11 8	—	—	5 48	9 9	6 29	9 1
W.	17	8 36	—	—	0 5	13 0	0 35	11 11	1 16	11 7	7 10	9 6	7 52	9 1
Th.	18	9 23	0 45	13 4	1 21	13 11	1 57	12 4	2 35	12 0	8 33	9 11	9 11	10 1
F.	19	10 9	1 49	14 6	2 13	15 1	3 10	13 0	3 42	12 8	9 40	10 7	10 7	10 11
S.	20	10 54	2 32	15 9	2 50	16 4	4 9	13 9	4 32	13 5	10 27	11 2	10 46	11 1
	21	11 37	3 7	17 0	3 24	17 6	4 54	14 5	5 14	13 11	11 3	12 8	11 20	11 11
M.	22	morn.	3 41	17 11	3 56	18 2	5 33	14 10	5 51	14 5	11 36	12 0	11 52	12 1
Tu.	23	0 19	4 11	18 5	4 27	18 7	6 8	15 2	6 23	14 9	—	—	0 7	12 4
W.	24	1 1	4 43	18 9	4 57	18 10	6 39	15 4	6 55	14 11	0 24	12 5	0 40	12 4
Th.	25	1 44	5 12	18 10	5 28	18 8	7 10	15 3	7 23	14 10	0 56	12 6	1 13	12 6
F.	26	2 27	5 43	18 6	5 58	18 3	7 37	14 11	7 52	14 7	1 28	12 5	1 44	12 4
S.	27	3 13	6 14	17 11	6 31	17 7	8 8	14 5	8 25	14 2	1 59	12 3	2 14	12 1
	28	4 1	6 49	17 1	7 8	16 6	8 41	14 0	8 55	13 9	2 32	11 11	2 50	11 4
M.	29	4 51	7 29	15 11	7 53	15 3	9 13	13 5	9 35	13 3	3 9	11 6	3 29	11 3
Half Mean Spring Range.			9ft. 6in.				7ft. 9in.				6ft. 4in.			
Phases of the Moon.			Moon's Declination at Noon.											
D. H. M.			M.D.			M.D.			M.D.			M.D.		
Last Quarter - 1 0 17 Morning.			1 17 3.42			9 18.39			17 20 N. 19			25 68. 1		
New - - - - - 7 6 10 Afternoon.			2 19 48			10 3 N. 36			18 18 55			26 10 2		
First Quarter 14 1 24 Afternoon.			3 20 50			11 8 30			19 16 43			27 13 4		
Full - - - - - 22 5 1 Afternoon.			4 20 34			12 12 46			20 13 50			28 16 4		
			5 18 54			13 16 14			21 10 24			29 19 1		
			6 15 55			14 18 46			22 6 33					
In Perigee - - 7 3 0 Afternoon.			7 11 49			15 20 17			23 2 26					
In Apogee - - 20 9 0 Afternoon.			8 6 55			16 20 48			24 1 8.49					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—

Brest add 18 m.

Devonport add 17 m.

Portsmouth add 4 m.

FEBRUARY, 1864.

DOVER.					SHEERNESS.					LONDON.					C's AGE AT NOON.		
EVENING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.					
Height. F. L.		Time. H. M.	Height. F. L.		Time. H. M.	Height. F. L.		Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.		Time. H. M.	Height. F. L.			
1 15	7	4 25	15	2	5 31	13	10	5 56	13	7	7 0	16	11	7 23	16	7	6
0 14	9	5 22	14	6	6 23	13	4	6 56	13	1	7 50	16	4	8 21	16	1	24.2
1 14	5	6 37	14	7	7 34	13	0	8 18	13	1	9 3	15	11	9 45	15	11	25.2
9 15	0	8 0	15	7	9 2	13	4	9 44	13	8	10 27	16	0	11 9	16	3	26.2
7 16	3	9 8	17	0	10 22	14	1	10 56	14	7	11 49	16	7	—	—		27.2
8 17	8	10 6	18	5	11 27	15	1	11 53	15	7	0 25	17	1	0 55	17	7	28.2
3 19	0	10 59	19	7	—	—		0 18	16	1	1 22	18	2	1 49	18	9	●
5 20	0	11 50	20	3	0 43	16	6	1 7	16	10	2 13	19	3	2 38	19	9	0.7
—		0 16	20	6	1 30	17	1	1 53	17	3	3 0	20	2	3 23	20	5	1.7
0 20	6	1 3	20	5	2 16	17	4	2 38	17	4	3 44	20	7	4 7	20	7	2.7
7 20	2	1 49	19	9	2 59	17	3	3 18	17	0	4 28	20	6	4 49	20	3	3.7
1 19	5	2 32	18	10	3 39	16	8	4 0	16	4	5 9	20	0	5 30	19	8	4.7
3 18	2	3 14	17	6	4 21	15	11	4 41	15	5	5 51	19	2	6 11	18	8	5.7
6 16	9	3 58	16	0	5 3	14	10	5 27	14	4	6 33	18	1	6 58	17	6	●
3 15	3	4 50	14	6	5 52	13	10	6 21	13	5	7 23	17	0	7 51	16	5	7.7
3 14	0	5 59	13	9	6 55	12	11	7 35	12	9	8 23	15	11	9 3	15	7	8.7
6 13	8	7 18	13	10	8 20	12	7	9 2	12	8	9 43	15	4	10 26	15	3	9.7
9 14	2	8 37	14	8	9 43	12	10	10 22	13	2	11 8	15	4	11 47	15	6	10.7
4 15	2	9 30	15	8	10 57	13	6	11 23	13	10	—	—		0 23	15	10	11.7
0 16	1	10 10	16	6	11 47	14	2	—	—		0 51	16	2	1 13	16	7	12.7
9 16	11	10 48	17	4	0 5	14	5	0 23	14	9	1 35	17	0	1 54	17	3	13.7
6 17	8	11 23	17	11	0 40	15	0	0 57	15	3	2 11	17	8	2 28	18	0	○
0 18	1	11 57	18	3	1 14	15	6	1 29	15	8	2 44	18	3	2 58	18	6	15.7
—		0 14	18	5	1 44	15	10	2 0	15	11	3 14	18	9	3 29	18	11	16.7
0 18	6	0 47	18	6	2 15	15	11	2 29	15	11	3 44	19	0	3 58	19	0	17.7
4 18	5	1 21	18	4	2 44	15	11	2 59	15	10	4 12	19	0	4 28	19	0	18.7
7 18	2	1 54	17	11	3 13	15	9	3 27	15	6	4 43	18	11	4 59	18	9	19.7
2 17	8	2 31	17	4	3 43	15	4	4 1	15	1	5 15	18	6	5 32	18	3	20.7
0 16	11	3 10	16	6	4 19	14	10	4 39	14	6	5 50	18	0	6 9	17	8	21.7
Spring }		9ft. 4in.					8ft. 0in.					9ft. 7in.					

Equation of Time at Noon.

S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
9		9	14 30		17	14 20		25	13 23	
17		10	14 31		18	14 15		26	13 14	
4		11	14 32		19	14 10		27	13 3	
10		12	14 32		20	14 3		28	12 52	
16		13	14 31		21	13 57		29	12 41	
11		14	14 29		22	13 49				
14		15	14 27		23	13 41				
18		16	14 23		24	13 33				

High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 1 subtract 8 m. SHEERNESS subtract 8 m. LONDON 0 m.

FEBRUARY, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTER.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.
M.	1	6 m 4	4 45	10 1	5 9	9 11	11 36	17 1	—	—	8 28	11 7	8 55	—
Tu.	2	6 58	5 34	9 9	6 3	9 8	0 7	16 9	0 41	16 5	9 27	11 1	10 5	—
W.	3	7 54	6 40	9 8	7 26	9 5	1 17	16 3	1 55	16 3	10 46	11 0	11 28	—
Th.	4	8 53	8 10	9 11	8 51	10 1	2 35	16 7	3 13	17 2	—	—	0 6	—
F.	5	9 54	9 29	10 4	10 4	10 8	3 50	17 10	4 25	18 7	0 41	11 11	1 15	—
S.	6	10 55	10 37	11 0	11 4	11 4	4 56	19 5	5 21	20 2	1 46	13 1	2 16	—
S.	7	11 54	11 30	11 8	11 56	11 11	5 46	20 9	6 12	21 5	2 42	14 2	3 7	—
M.	8	0 51	—	—	0 20	12 2	6 37	21 11	7 1	22 4	3 30	15 0	3 53	—
Tu.	9	1 46	0 43	12 3	1 6	12 4	7 25	22 8	7 49	22 10	4 16	15 8	4 38	—
W.	10	2 39	1 30	12 5	1 52	12 4	8 10	22 9	8 32	22 8	5 0	15 9	5 22	—
Th.	11	3 31	2 14	12 2	2 35	12 0	8 53	22 4	9 14	21 10	5 43	15 4	6 5	—
F.	12	4 23	2 57	11 10	3 18	11 7	9 36	21 4	9 57	20 7	6 27	14 6	6 49	—
S.	13	5 14	3 39	11 4	3 59	11 0	10 17	19 10	10 39	19 1	7 11	13 6	7 35	—
S.	14	6 6	4 19	10 9	4 41	10 5	11 4	18 4	11 32	17 7	7 59	12 5	8 24	—
M.	15	6 57	5 5	10 2	5 32	9 10	—	—	0 5	16 10	8 53	11 5	9 26	—
Tu.	16	7 47	6 3	9 7	6 41	9 6	0 40	16 2	1 18	15 9	10 6	10 7	10 48	—
W.	17	8 36	7 28	9 5	8 9	9 5	1 56	15 7	2 34	15 7	11 27	10 5	—	—
Th.	18	9 23	8 50	9 6	9 29	9 8	3 12	15 10	3 50	16 4	0 5	10 7	0 42	—
F.	19	10 9	10 5	9 11	10 32	10 2	4 27	16 11	4 52	17 5	1 16	11 3	1 42	—
S.	20	10 54	10 58	10 5	11 17	10 7	5 16	17 11	5 34	18 5	2 8	12 0	2 28	—
S.	21	11 37	11 35	10 9	11 53	11 0	5 52	18 10	6 9	19 2	2 47	12 8	3 5	—
M.	22	morn.	—	—	0 10	11 2	6 26	19 6	6 44	19 10	3 22	13 3	3 37	—
Tu.	23	0 19	0 27	11 3	0 42	11 4	7 0	20 1	7 15	20 3	3 52	13 9	4 7	—
W.	24	1 1	0 56	11 5	1 12	11 5	7 31	20 6	7 47	20 7	4 23	14 1	4 37	—
Th.	25	1 44	1 28	11 5	1 43	11 5	8 2	20 7	8 17	20 7	4 51	14 3	5 7	—
F.	26	2 27	1 58	11 4	2 14	11 3	8 32	20 6	8 47	20 5	5 22	14 1	5 38	—
S.	27	3 13	2 30	11 2	2 45	11 1	9 2	20 1	9 19	19 9	5 53	13 8	6 10	—
S.	28	4 1	3 1	10 11	3 19	10 10	9 37	19 5	9 55	18 11	6 28	13 2	6 48	—
M.	29	4 51	3 37	10 8	3 55	10 5	10 14	18 6	10 35	18 0	7 9	12 6	7 31	—
Half Mean Spring Range.			5 ft. 9 in.				10 ft. 5 in.				7 ft. 2 in.			
Phases of the Moon.							Moon's Declination at Noon.							
			D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°
Last Quarter			1	0	17	Morning.	1	17	42	9	18	39	17	20 N. 19
New			7	6	10	Afternoon.	2	19	48	10	3	N. 36	18	18 55
First Quarter			14	1	24	Afternoon.	3	20	50	11	8	30	19	16 43
Full			22	5	1	Afternoon.	4	20	34	12	12	46	20	13 50
							5	18	54	13	16	14	21	10 24
In Perigee			7	3	0	Afternoon.	6	15	55	14	18	46	22	6 33
In Apogee			20	9	0	Afternoon.	7	11	49	15	20	17	23	2 26
							8	6	55	16	20	48	24	1 S. 49

The Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

FEBRUARY, 1864.

MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's Age at Noon.
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.	D.						
1	9 49 11 1	10 21 10 10	9 55 9 5	10 22 9 3	10 12 10 5	10 44 10 1	9	1	10 59 10 9	11 41 10 10	10 58 9 1	11 38 9 1	11 19 9 11	11 57 9 10	24.2										
2	10 59 10 9	11 41 10 10	10 58 9 1	11 38 9 1	11 19 9 11	11 57 9 10	24.2																		
3	—	0 24 11 1	—	0 22 9 2	—	0 36 9 11	25.2																		
4	1 4 11 5	1 40 11 11	1 4 9 5	1 46 9 9	1 15 10 11	1 54 10 5	26.2																		
5	2 12 12 6	2 43 13 2	2 25 10 1	2 58 10 7	2 35 10 11	3 12 11 4	27.2																		
6	3 11 13 9	3 36 14 5	3 29 11 0	3 57 11 6	3 45 11 9	4 15 12 3	28.2																		
7	4 1 15 0	4 25 15 6	4 24 11 11	4 49 12 3	4 45 12 8	5 11 12 11	29.2																		
8	4 48 16 0	5 11 16 4	5 13 12 7	5 37 12 9	5 36 13 2	5 58 13 5	30.2																		
9	5 35 16 6	5 57 16 5	6 1 12 11	6 24 12 11	6 22 13 6	6 45 13 6	31.2																		
10	6 19 16 4	6 41 16 0	6 46 12 10	7 7 12 7	7 7 13 6	7 28 13 4	32.2																		
11	7 3 15 8	7 25 15 2	7 28 12 4	7 49 12 0	7 49 13 2	8 10 12 11	33.2																		
12	7 46 14 8	8 8 14 0	8 10 11 8	8 29 11 3	8 30 12 7	8 47 12 3	34.2																		
13	8 31 13 4	8 55 12 7	8 47 10 10	9 8 10 4	9 5 11 10	9 24 11 5	35.2																		
14	9 19 11 10	9 47 11 2	9 30 9 11	9 53 9 6	9 44 10 11	10 10 10 6	36.2																		
15	10 20 10 8	11 0 10 4	10 21 9 1	10 59 8 10	10 43 10 0	11 20 9 8	37.2																		
16	11 43 10 3	—	11 40 8 8	—	11 58 9 5	—	38.2																		
17	0 23 10 3	1 3 10 4	0 21 8 7	1 3 8 8	0 36 9 4	1 14 9 5	39.2																		
18	1 41 10 7	2 15 11 0	1 44 8 11	2 24 9 2	1 53 9 7	2 33 9 11	40.2																		
19	2 40 11 5	3 3 11 11	2 53 9 5	3 20 9 9	3 5 10 2	3 34 10 6	41.2																		
20	3 23 12 3	3 42 12 8	3 41 10 0	4 1 10 4	3 57 10 10	4 19 11 12	42.2																		
21	3 59 13 1	4 15 13 5	4 20 10 7	4 38 10 10	4 39 11 4	5 0 11 7	43.2																		
22	4 32 13 9	4 47 14 0	4 55 11 1	5 12 11 3	5 18 11 9	5 35 11 11	44.2																		
23	5 1 14 3	5 17 14 6	5 28 11 5	5 44 11 6	5 49 12 0	6 4 12 2	45.2																		
24	5 33 14 7	5 48 14 7	6 0 11 7	6 15 11 8	6 20 12 3	6 35 12 3	46.2																		
25	6 4 14 7	6 20 14 6	6 31 11 8	6 46 11 7	6 51 12 4	7 7 12 3	47.2																		
26	6 35 14 4	6 51 14 1	7 2 11 6	7 17 11 4	7 23 12 3	7 38 12 2	48.2																		
27	7 8 13 10	7 26 13 7	7 33 11 2	7 50 10 11	7 53 12 0	8 9 11 11	49.2																		
28	7 45 13 3	8 6 12 10	8 7 10 8	8 24 10 5	8 26 11 8	8 43 11 5	50.2																		
29	8 27 12 4	8 51 11 10	8 42 10 2	9 4 9 11	9 0 11 2	9 19 10 11	51.2																		
If Mean Spring Range. } 7ft. 5in.								5ft. 10in.								6ft. 2in.									

Equation of Time at Noon.

M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
13	49	Sub.	9	14	30	Sub.	17	14	20	Sub.	25	13	23	Sub.
13	57		10	14	31		18	14	15		26	13	14	
14	4		11	14	32		19	14	10		27	13	3	
14	10		12	14	32		20	14	3		28	12	52	
14	16		13	14	31		21	13	57		29	12	41	
14	21		14	14	29		22	13	49					
14	24		15	14	27		23	13	41					
14	28		16	14	23		24	13	33					

of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
 GALWAY add 11 m. QUEENSTOWN add 6 m. WATERFORD add 3 m.

TIDE TABLES FOR THE

MARCH, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.								DEVONPORT.								PORTSMOUTH.								
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.
Tu.	1	5m45	8	19	14	7	8	50	14	1	10	0	12	9	10	25	12	9	3	51	10	11	4	16			
W.	2	6 41	9	25	13	9	10	7	13	7	10	55	12	3	11	30	12	5	4	46	10	4	5	20			
Th.	3	7 39	10	55	13	9	11	44	14	2	—	—	—	—	0	13	12	0	6	1	10	0	6	44			
F.	4	8 37	—	—	—	—	0	26	14	10	0	58	12	8	1	46	12	6	7	32	10	3	8	14			
S.	5	9 35	1	3	15	9	1	35	16	8	2	29	13	7	3	8	13	7	8	54	11	2	9	27			
M.	6	10 32	2	1	17	9	2	27	18	8	3	42	14	9	4	13	14	7	9	55	12	2	10	22			
Tu.	7	11 28	2	50	19	7	3	13	20	4	4	40	15	9	5	8	15	5	10	46	13	0	11	9			
W.	8	0 22	3	36	20	10	3	58	21	2	5	33	16	6	5	56	16	2	11	32	13	6	11	54			
Th.	9	1 16	4	20	21	4	4	42	21	3	6	21	16	10	6	43	16	6	—	—	—	—	0	16			
F.	10	2 10	5	3	21	1	5	24	20	9	7	5	16	9	7	24	16	3	0	39	13	9	1	2			
S.	11	3 3	5	44	20	3	6	4	19	8	7	44	16	3	8	2	15	10	1	24	13	5	1	45			
M.	12	3 56	6	25	18	11	6	44	18	1	8	22	15	6	8	41	15	0	2	5	12	11	2	26			
Tu.	13	4 49	7	4	17	2	7	27	16	3	8	58	14	6	9	16	14	1	2	45	12	3	3	5			
W.	14	5 41	7	51	15	3	8	15	14	4	9	35	13	5	9	56	13	2	3	27	11	5	3	49			
Th.	15	6 31	8	42	13	7	9	15	12	11	10	18	12	3	10	44	12	3	4	12	10	6	4	39			
F.	16	7 19	9	54	12	7	10	38	12	6	11	15	11	4	11	53	11	9	5	10	9	9	5	47			
S.	17	8 6	11	24	12	8	—	—	—	—	—	—	—	—	0	34	11	3	6	29	9	4	7	13			
M.	18	8 51	0	6	12	11	0	43	13	5	1	15	12	1	1	56	11	9	7	53	9	8	8	32			
Tu.	19	9 34	1	16	14	0	1	41	14	8	2	33	12	9	3	5	12	5	9	6	10	4	9	32			
W.	20	10 17	2	3	15	4	2	22	16	1	3	35	13	6	3	59	13	2	9	55	11	0	10	16			
Th.	21	10 59	2	38	16	8	2	54	17	2	4	22	14	2	4	42	13	11	10	33	11	7	10	50			
F.	22	11 42	3	10	17	10	3	26	18	4	5	2	14	9	5	20	14	6	11	6	12	1	11	22			
S.	23	morn.	3	41	18	7	3	56	18	9	5	37	15	3	5	53	15	0	11	37	12	5	11	52			
M.	24	0 26	4	12	19	0	4	29	19	1	6	9	15	5	6	26	15	2	—	—	—	—	0	8			
Tu.	25	1 11	4	45	19	0	5	0	18	11	6	43	15	4	6	59	15	2	0	26	12	7	0	43			
W.	26	1 59	5	17	18	10	5	34	18	7	7	12	15	2	7	28	15	0	1	1	12	6	1	17			
Th.	27	2 49	5	51	18	3	6	10	17	11	7	45	14	9	8	2	14	8	1	35	12	4	1	52			
F.	28	3 41	6	29	17	5	6	50	16	10	8	20	14	3	8	37	14	3	2	10	12	1	2	36			
S.	29	4 36	7	12	16	3	7	37	15	8	8	56	13	8	9	18	13	9	2	51	11	8	3	12			
M.	30	5 32	8	4	15	0	8	36	14	5	9	43	13	0	10	9	13	2	3	36	11	2	4	1			
Tu.	31	6 28	9	11	14	1	9	53	14	0	10	42	12	5	11	17	12	9	4	33	10	6	5	6			
Half Mean Spring } Range.			9 ^{ft.} 6 ^{in.}								7 ^{ft.} 9 ^{in.}								6 ^{ft.} 4 ^{in.}								
Phases of the Moon.												Moon's Declination at Noon.															
D. H. M.												M.D. ° ' "															
Last Quarter - 1 1 11 Afternoon.												1 20 8.23 9 6 N.14 17 17 N.12 25															
New - - - - 8 3 59 Morning.												2 20 34 10 10 53 18 14 31 26															
First Quarter - 15 6 7 Morning.												3 19 29 11 14 46 19 11 16 27															
Full - - - - 23 10 24 Morning.												4 17 9 12 17 44 20 7 33 28															
Last Quarter - 30 10 20 Afternoon.												5 13 38 13 19 39 21 3 32 29															
												6 9 12 14 20 29 22 0 8.40 30															
In Apogee - - 7 2 0 Morning.												7 4 10 15 20 18 23 4 54 31															
In Perigee - - 19 8 0 Morning.												8 1 N. 6 16 19 10 24 8 58															

MARCH, 1864.

DOVER.					SHEERNESS.					LONDON.					C's AGE AT NOON.
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			
Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.		
3 32 16 0		3 57 15 6			4 59 14 2		5 23 13 10			6 30 17 4		6 54 16 11		☾	
4 26 15 0		4 57 14 7			5 52 13 6		6 25 13 3			7 20 16 7		7 51 16 3	23.7		
5 33 14 4		6 14 14 5			7 4 13 0		7 49 13 0			8 28 16 0		9 13 15 10	24.7		
6 58 14 10		7 39 15 5			8 36 13 2		9 23 13 6		10 1 15 11	10 46 16 2			25.7		
8 19 16 2		8 50 16 11		10 3 14 0			10 39 14 6		11 30 16 6	—		—	26.7		
9 18 17 9		9 45 18 5		11 9 15 1		11 35 15 7		0 7 17 0		0 38 17 7		7 27.7			
10 11 19 1		10 36 19 8		11 59 16 1		—		1 5 18 2		1 30 18 9		9 28.7			
11 1 20 1		11 26 20 4		0 23 16 6		0 46 16 11		1 54 19 4		2 17 19 9		9 ●			
11 49 20 6		—		1 9 17 2		1 31 17 4		2 39 20 2		3 0 20 5		5 1.3			
0 13 20 6		0 36 20 4		1 52 17 5		2 13 17 4		3 22 20 7		3 44 20 7		7 2.3			
0 59 20 1		1 22 19 9		2 34 17 2		2 54 17 0		4 5 20 6		4 25 20 3		3 3.3			
1 44 19 3		2 6 18 9		3 14 16 9		3 34 16 4		4 45 20 0		5 4 19 7		7 4.3			
2 26 18 2		2 47 17 6		3 55 15 11		4 15 15 5		5 25 19 2		5 44 18 7		7 5.3			
3 8 16 9		3 30 16 0		4 35 14 10		4 57 14 4		6 7 18 1		6 28 17 6		6 6.3			
3 53 15 3		4 18 14 7		5 22 13 10		5 48 13 4		6 53 16 11		7 17 16 5		5 ☾			
4 46 13 11		5 21 13 7		6 18 12 11		6 54 12 7		7 47 15 11		8 22 15 6		6 8.3			
5 59 13 5		6 39 13 6		7 35 12 5		8 20 12 5		9 3 15 3		9 45 15 1		7 9.3			
7 19 13 10		7 58 14 3		9 4 12 7		9 44 12 10		10 27 15 2		11 9 15 4		10 10.3			
8 31 14 9		8 56 15 4		10 20 13 2		10 52 13 6		11 46 15 7		—		11 11.3			
9 18 15 10		9 39 16 4		11 16 13 11		11 37 14 3		0 18 15 11		0 42 16 4		12 12.3			
9 57 16 9		10 15 17 2		11 55 14 7		—		1 3 16 9		1 23 17 2		13 13.3			
10 33 17 7		10 50 18 0		0 11 14 11		0 27 15 3		1 41 17 6		1 58 17 10		14 14.3			
11 7 18 2		11 24 18 4		0 43 15 6		0 59 15 8		2 13 18 2		2 28 18 6		15 ○			
11 41 18 6		11 59 18 7		1 14 15 10		1 28 16 0		2 43 18 9		2 59 18 11		16 16.3			
—		0 17 18 8		1 44 16 1		2 0 16 1		3 13 19 1		3 31 19 2		17 17.3			
0 35 18 7		0 53 18 6		2 16 16 1		2 32 16 0		3 45 19 2		4 1 19 2		18 18.3			
1 12 18 4		1 30 18 2		2 48 15 11		3 4 15 9		4 18 19 1		4 35 18 11		19 19.3			
1 50 17 11		2 10 17 7		3 21 15 7		3 39 15 4		4 53 18 9		5 10 18 6		20 20.3			
2 32 17 2		2 54 16 9		3 59 15 1		4 20 14 9		5 30 18 3		5 49 17 11		21 21.3			
3 17 16 3		3 43 15 9		4 42 14 4		5 7 14 0		6 13 17 7		6 38 17 2		22 ☾			
4 13 15 4		4 44 14 11		5 36 13 9		6 11 13 5		7 5 16 9		7 38 16 6		23 23.3			

Mean Spring }
Range. } 9ft. 4in.

8ft. 0in.

9ft. 7in.

Equation of Time at Noon.

M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
12 29	Sub.	9	10 38	Sub.	17	8 24	Sub.	25	5 58	Sub.
12 17		10	10 22		18	8 6		26	5 39	
12 4		11	10 6		19	7 48		27	5 21	
11 50		12	9 50		20	7 30		28	5 2	
11 37		13	9 33		21	7 12		29	4 44	
11 22		14	9 16		22	6 54		30	4 26	
11 8		15	8 59		23	6 35		31	4 7	
10 53		16	8 42		24	6 17				

of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

MARCH, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.							
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.					
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.				
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.				
Tu.	1	5m45	4 15	10 3	4 37	10 1	11 17	6 11	32 17	1 7 55	11 10	8 24	11 11					
W.	2	6 41	5 5	9 11	5 36	9 9	—	—	0 10 16	7 8 57	11 3	9 35	11 11					
Th.	3	7 39	6 12	9 9	6 56	9 8	0 49 16	3 1	29 16	2 10 19	10 11	11 3	11 11					
F.	4	8 37	7 44	9 9	8 31	9 10	2 11 16	4 2	53 16	10 11 47	11 4	—	—					
S.	5	9 35	9 10	10 3	9 46	10 8	3 31 17	8 4	8 18	6 0 23	11 10	0 58	12 12					
S.	6	10 32	10 18	11 0	10 46	11 4	4 38 19	4 5	4 20	2 1 28	12 1	1 56	13 13					
M.	7	11 28	11 11	11 8	11 36	12 0	5 28 20	11 5	51 21	6 2 23	14 2	2 48	14 14					
Tu.	8	0a22	11 59	12 2	—	—	6 14 22	0 6	38 22	5 3 10	15 1	3 32	15 15					
W.	9	1 16	0 22	12 4	0 43	12 5	7 2 22	8 7	24 22	10 3 54	15 8	4 15	15 15					
Th.	10	2 10	1 5	12 5	1 27	12 4	7 46 22	10 8	8 22	8 4 36	15 10	4 57	15 15					
F.	11	3 3	1 49	12 3	2 10	12 1	8 28 22	4 8	49 21	11 5 18	15 5	5 39	15 15					
S.	12	3 56	2 31	11 10	2 52	11 7	9 9 21	3 9	30 20	7 6 0	14 6	6 22	14 14					
S.	13	4 49	3 12	11 4	3 32	11 0	9 50 19	10 10	10 19	1 6 43	13 6	7 5	13 13					
M.	14	5 41	3 52	10 8	4 13	10 5	10 33 18	4 11	0 17	7 7 29	12 5	7 54	11 11					
Tu.	15	6 31	4 36	10 1	5 1	9 9	11 29 16	10 11	—	8 20	11 4	8 50	10 10					
W.	16	7 19	5 28	9 6	6 1	9 4	0 2 16	2 0	39 15	7 9 25	10 6	10 6	10 10					
Th.	17	8 6	6 42	9 3	7 28	9 3	1 17 15	3 1	56 15	3 10 48	10 3	11 29	10 10					
F.	18	8 51	8 12	9 4	8 51	9 6	2 36 15	5 3	13 15	10 0	—	0 6	10 10					
S.	19	9 34	9 27	9 9	9 59	10 0	3 48 16	5 4	21 17	0 0 40	10 11	1 11	11 11					
S.	20	10 17	10 24	10 3	10 47	10 6	4 44 17	7 5	6 18	2 1 34	11 9	1 56	12 12					
M.	21	10 59	11 6	10 9	11 23	10 11	5 23 18	8 5	39 19	1 2 17	12 7	2 35	12 12					
Tu.	22	11 42	11 40	11 1	11 56	11 3	5 55 19	6 6	12 19	10 2 52	13 2	3 8	13 13					
W.	23	morn.	—	—	0 12	11 5	6 29 20	2 6	45 20	5 3 23	13 9	3 37	13 13					
Th.	24	0 26	0 27	11 6	0 41	11 6	7 0 20	7 7	16 20	9 3 51	14 2	4 7	14 14					
F.	25	1 11	0 57	11 7	1 14	11 7	7 33 20	10 7	50 20	10 4 23	14 5	4 39	14 14					
S.	26	1 59	1 30	11 6	1 46	11 5	8 5 20	9 8	22 20	8 4 55	14 4	5 11	14 14					
S.	27	2 49	2 3	11 4	2 20	11 3	8 39 20	5 8	55 20	1 5 28	13 11	5 46	13 13					
M.	28	3 41	2 38	11 1	3 57	10 11	9 15 19	9 9	35 19	3 6 6	13 5	6 27	13 13					
Tu.	29	4 36	3 17	10 9	3 37	10 7	9 56 18	10 10	18 18	4 6 50	12 9	7 14	13 13					
W.	30	5 32	3 58	10 4	4 22	10 2	10 43 17	10 11	16 17	4 7 39	12 1	8 9	11 11					
Th.	31	6 28	4 50	10 0	5 22	9 10	11 55 16	11 11	—	8 43	11 5	9 21	11 11					
Half Mean Spring Range.			5ft. 9in.				10ft. 5in.				7ft. 2in.							
Phases of the Moon.							Moon's Declination at Noon.											
D. H. M.							M. D.		° ' "		M. D.		° ' "		M. D.		° ' "	
Last Quarter - 1 1 11 Afternoon.							1		20 8.23		9 6 N.14		17 17 N.12		25 128.4			
New - - - 8 3 59 Morning.							2		20 34		10 10 53		18 14 31		26 15 9			
First Quarter - 15 6 7 Morning.							3		19 29		11 14 46		19 11 16		27 18 2			
Full - - - 23 10 24 Morning.							4		17 9		12 17 44		20 7 33		28 19 5			
Last Quarter - 30 10 20 Afternoon.							5		13 38		13 19 39		21 3 32		29 20 2			
							6		9 12		14 20 29		22 03.40		30 19 4			
In Apogee - 7 2 0 Morning.							7		4 10		15 20 18		23 4 54		31 17 4			
In Perigee - 19 8 0 Morning.							■		1 N. 6		16 19 10		24 8 58					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

MARCH, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	
Tu.	1	5m45	4 15	8 10	4 41	8 8	3 26	21 9	3 52	21 1	10 37	16 9	11 4	16	
W.	2	6 41	5 11	8 6	5 45	8 4	4 25	20 6	5 3	20 0	11 33	15 8	—	—	
Th.	3	7 39	6 26	8 3	7 10	8 2	5 49	19 11	6 39	20 2	0 9	15 5	0 51	15	
F.	4	8 37	7 57	8 4	8 38	8 7	7 26	20 9	8 6	21 7	1 42	15 11	2 28	16	
S.	5	9 35	9 16	8 10	9 48	9 1	8 43	22 8	9 12	23 8	3 9	17 6	3 44	18	
S.	6	10 32	10 16	9 5	10 42	9 8	9 37	24 9	10 1	25 9	4 14	19 7	4 44	20	
M.	7	11 28	11 8	9 10	11 33	10 0	10 24	26 7	10 47	27 3	5 11	21 5	5 37	22	
Tu.	8	0a22	11 58	10 2	—	—	11 10	27 10	11 33	28 3	6 2	22 8	6 25	23	
W.	9	1 16	0 22	10 4	0 44	10 5	11 55	28 6	—	—	6 46	23 3	7 8	23	
Th.	10	2 10	1 6	10 5	1 28	10 5	0 17	28 6	0 39	28 4	7 30	23 0	7 51	22	
F.	11	3 3	1 50	10 4	2 11	10 2	1 1	27 11	1 21	27 4	8 11	22 2	8 32	21	
S.	12	3 56	2 30	10 0	2 50	9 10	1 41	26 6	2 1	25 8	8 53	20 10	9 12	20	
S.	13	4 49	3 10	9 7	3 29	9 4	2 20	24 9	2 40	23 9	9 31	19 1	9 51	18	
M.	14	5 41	3 50	9 1	4 13	8 10	3 2	22 10	3 25	21 10	10 12	17 5	10 33	16	
Tu.	15	6 31	4 37	8 7	5 3	8 4	3 49	20 9	4 18	19 11	10 55	15 8	11 22	14	
W.	16	7 19	5 35	8 1	6 13	7 11	4 53	19 2	5 35	18 9	11 57	14 5	—	—	
Th.	17	8 6	6 55	7 10	7 38	7 10	6 22	18 9	7 8	18 11	0 36	14 3	1 21	14	
F.	18	8 51	8 18	7 11	8 55	8 1	7 47	19 4	8 24	20 0	2 6	14 8	2 47	15	
S.	19	9 34	9 28	8 4	9 54	8 6	8 55	20 8	9 18	21 5	3 22	15 10	3 49	16	
S.	20	10 17	10 16	8 8	10 37	8 10	9 39	22 2	9 57	22 10	4 14	17 3	4 36	17	
M.	21	10 59	10 55	9 0	11 12	9 1	10 13	23 6	10 28	24 0	4 56	18 6	5 15	19	
Tu.	22	11 42	11 30	9 3	11 47	9 4	10 44	24 6	11 0	24 11	5 34	19 7	5 52	20	
W.	23	morn.	—	—	0 4	9 6	11 16	25 3	11 31	25 7	6 8	20 4	6 23	20	
Th.	24	0 26	0 19	9 7	0 36	9 8	11 47	25 10	—	—	6 39	20 10	6 55	21	
F.	25	1 11	0 53	9 9	1 10	9 9	0 4	25 11	0 21	25 11	7 11	21 0	7 27	20	
S.	26	1 59	1 27	9 9	1 43	9 8	0 38	25 11	0 54	25 9	7 44	20 9	8 1	20	
S.	27	2 49	2 0	9 8	2 17	9 7	1 11	25 5	1 28	25 0	8 18	20 2	8 37	19	
M.	28	3 41	2 36	9 6	2 55	9 4	1 46	24 6	2 5	24 0	8 57	19 4	9 17	18	
Tu.	29	4 36	3 15	9 2	3 35	9 1	2 25	23 5	2 46	22 10	9 37	18 3	9 59	17	
W.	30	5 32	3 59	8 11	4 26	8 9	3 10	22 2	3 37	21 6	10 23	17 2	10 50	16	
Th.	31	6 28	4 57	8 8	5 31	8 6	4 11	20 11	4 49	20 5	11 20	16 0	11 56	15	
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'
Last Quarter - 1 1 11 Afternoon.							1	20	8.23	9	6	N.14	17	17	N.12
New - - - - - 8 3 59 Morning.							2	20	34	10	10	53	18	14	31
First Quarter 15 6 7 Morning.							3	19	29	11	14	46	19	11	16
Full - - - - - 23 10 24 Morning.							4	17	9	12	17	44	20	7	33
Last Quarter - 30 10 20 Afternoon.							5	13	38	13	19	39	21	3	32
							6	9	12	14	20	29	22	0	S.40
In Apogee - - 7 2 0 Morning.							7	4	10	15	20	18	23	4	54
In Perigee - - 19 8 0 Morning.							8	1	N. 6	16	19	10	24	8	58

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—

GREENOCK add 19 m.

LIVERPOOL add 18 m.

PEMBROKE add 20 m.

MARCH, 1864.

DARTMOUTH.												FVLL.												SUNDERLAND.											
Morning.						Afternoon.						Morning.						Afternoon.						Morning.						Afternoon.					
		Time. Height.				Time. Height.				Time. Height.				Time. Height.				Time. Height.				Time. Height.				Time. Height.									
		H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.	H. M. P. L.										
Tu.	1	6 41	6	57	12	3	4	37	12	11	1	57	6	11	32	17	1	7	55	11	10	8	24	11											
W.	2	5 41	5	57	11	2	3	36	9	9	—	—	0	10	15	7	5	57	11	5	9	35	11												
Th.	3	4 22	4	14	9	2	2	35	9	8	0	49	15	3	1	25	15	2	10	19	10	11	11	3	11										
F.	4	3 20	3	44	9	1	1	31	9	7	2	11	15	4	2	53	15	10	11	47	11	4	—	—											
M.	5	2 51	2	15	10	0	0	4	10	6	3	31	17	5	4	5	18	6	0	25	11	10	0	58	12										
▲	6	1 22	1	18	11	0	0	12	4	4	38	19	4	5	4	20	2	1	28	13	1	1	56	13											
M.	7	11 26	11	11	11	8	11	36	12	0	5	28	20	11	5	51	21	6	2	23	14	2	2	48	14										
Th.	8	10 22	10	12	12	2	—	—	—	6	14	22	0	6	38	22	5	3	10	15	1	3	32	15											
W.	9	1 16	1	22	12	4	0	43	12	5	7	22	8	7	24	22	10	3	54	15	8	4	15	15											
Th.	10	2 10	2	14	1	5	1	27	12	4	7	45	22	10	8	8	22	8	4	36	15	10	4	57	15										
F.	11	3 1	3	49	12	3	2	10	12	1	8	28	22	4	8	49	21	11	5	18	15	5	5	39	15										
M.	12	3 56	3	11	1	10	2	52	11	7	9	9	21	3	9	30	20	7	6	0	14	6	6	22	14										
▲	13	4 49	3	12	11	4	3	32	11	0	9	50	19	10	10	10	19	1	6	43	13	6	7	5	12										
M.	14	5 41	3	52	10	8	4	13	10	5	10	33	18	4	11	0	17	7	7	29	12	5	7	54	12										
Th.	15	6 11	4	36	10	1	5	1	9	9	11	29	16	10	—	—	—	8	20	11	4	8	50	10											
W.	16	7 10	5	28	9	6	6	1	9	4	0	2	16	2	0	39	15	7	9	25	10	6	10	6	10										
Th.	17	8 6	6	42	9	3	7	28	9	3	1	17	15	3	1	56	15	3	10	48	10	3	11	29	10										
F.	18	8 51	8	12	9	4	8	51	9	6	2	36	15	5	3	13	15	10	—	—	—	0	6	10											
M.	19	9 14	9	27	9	0	9	56	10	0	3	48	16	5	4	21	17	0	0	40	10	11	1	11	11										
▲	20	10 17	10	24	10	1	10	47	10	6	4	44	17	7	5	6	18	2	1	34	11	9	1	56	12										
M.	21	10 50	11	6	10	9	11	23	10	11	5	23	18	8	5	39	19	1	2	17	12	7	2	35	12										
Th.	22	11 42	11	40	11	1	11	56	11	3	5	55	19	6	6	12	19	10	2	52	13	2	3	8	13										
W.	23	morn.	—	—	—	0	12	11	5	6	29	20	2	6	45	20	5	3	23	13	9	3	37	13											
Th.	24	0 26	0	27	11	6	0	41	11	6	7	0	20	7	7	16	20	9	3	51	14	2	4	7	14										
F.	25	1 11	0	57	11	7	1	14	11	7	7	33	20	10	7	50	20	10	4	23	14	5	4	39	14										
M.	26	1 50	1	10	11	8	1	46	11	5	8	5	20	9	8	22	20	8	4	55	14	4	5	11	14										
▲	27	2 40	2	11	11	4	2	20	11	3	8	39	20	5	8	55	20	1	5	28	13	11	5	46	13										
M.	28	3 41	2	38	11	1	2	57	10	11	9	15	10	9	9	35	19	3	6	6	13	5	6	27	13										
Th.	29	4 10	3	17	10	0	3	37	10	7	0	56	18	10	10	18	18	4	6	50	12	9	7	14	12										
W.	30	5 10	3	58	10	4	4	22	10	2	10	43	17	10	11	16	17	4	7	39	12	1	8	9	11										
Th.	31	6 28	4	50	10	0	5	22	9	10	11	55	10	11	—	—	—	8	43	11	5	9	21	11											
Half Moon Spring Low												10th. 5th.												7th. 2th.											
Phase of the Moon.												Moon's Declination at Noon.																							
W. M. M.												M.D. °						M.D. °						M.D. °						M.D. °					
Last Quarter 4 11 A.M.												1 20 23						2 28 14						17 17 12						25 12 43					
New 8 10 Morning.												2 20 24						3 20 15						18 14 31						25 15 56					
First Quarter 12 10 Morning.												3 20 25						4 20 16						19 11 25						27 18 24					
Full 16 10 Morning.												4 20 26						5 20 17						22 7 33						28 19 51					
Last Quarter 20 10 A.M.												5 20 28						6 20 18						21 5 32						29 20 21					
In Aspect 24 10 Morning.												6 20 29						7 20 19						22 0 32						30 19 4					
In Degree 28 10 Morning.												7 20 30						8 20 20						22 5 33						31 17 4					

The times of High Water are given for Mean Time at 2 1/2 feet. If clockwork or Railway Time be required,—

Eastern add 1 m.

Irish add 1 m.

Western add 1 m.

MARCH, 1864.

MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C's Age at Noon.
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	Time. H. M. P. L.	Height. F. L.	D.						
1	7 59	10 9	8 30	10 4	6 54	13 6	7 24	13 1	0 46	10 4	1 16	10 0	0												
2	9 6	10 0	9 47	9 10	8 0	12 9	8 40	12 6	1 51	9 9	2 31	9 6	23.7												
3	10 31	10	11 15	10 0	9 25	12 5	10 10	12 8	3 18	9 5	4 8	9 6	24.7												
4	12 0	10 4	—	—	10 53	12 11	11 30	13 5	4 54	9 8	5 32	10 1	25.7												
5	0 37	10 10	1 11	11 4	—	—	0 5	14 0	6 7	10 8	6 35	11 5	26.7												
6	1 39	11 10	2 3	12 5	0 33	14 8	0 58	15 4	6 57	12 2	7 18	12 11	27.7												
7	2 27	13 0	2 49	13 6	1 22	16 0	1 46	16 8	7 37	13 7	7 57	14 2	28.7												
8	3 10	14 0	3 32	14 4	2 8	17 2	2 31	17 7	8 19	14 7	8 40	14 9	●												
9	3 54	14 6	4 15	14 8	2 52	17 9	3 12	17 10	9 0	14 10	9 21	14 9	1.3												
10	4 37	14 7	4 59	14 5	3 33	17 9	3 55	17 7	9 43	14 7	10 6	14 3	2.3												
11	5 21	14 1	5 43	13 9	4 16	17 3	4 38	16 10	10 28	13 10	10 49	13 4	3.3												
12	6 4	13 4	6 26	12 11	4 59	16 5	5 20	15 11	11 11	12 9	11 33	12 2	4.3												
13	6 46	12 5	7 7	11 11	5 41	15 5	6 3	14 9	11 55	11 7	—	—	5.3												
14	7 31	11 4	7 58	10 9	6 28	14 2	6 53	13 6	0 19	11 0	0 45	10 5	6.3												
15	8 26	10 2	8 58	9 8	7 21	12 11	7 53	12 5	1 12	9 10	1 43	9 4	7.3												
16	9 36	9 4	10 18	9 2	8 29	12 0	9 11	11 9	2 20	8 11	3 4	8 8	8.3												
17	11 0	9 2	11 42	9 4	9 55	11 9	10 35	11 10	3 51	8 8	4 35	8 8	9.3												
18	—	—	0 20	9 7	11 13	12 1	11 47	12 5	5 14	8 10	5 49	9 1	10.3												
19	0 54	9 11	1 23	10 3	—	—	0 17	12 9	6 19	9 6	6 41	10 0	11.3												
20	1 45	10 7	2 5	10 11	0 39	13 3	0 59	13 9	6 59	10 6	7 15	11 1	12.3												
21	2 23	11 4	2 38	11 9	1 17	14 3	1 34	14 8	7 29	11 6	7 43	12 0	13.3												
22	2 54	12 1	3 9	12 5	1 50	15 1	2 6	15 5	7 56	12 5	8 10	12 9	14.3												
23	3 23	12 8	3 37	12 10	2 21	15 9	2 36	16 0	8 24	13 0	8 38	13 2	15.3												
24	3 52	13 0	4 8	13 2	2 50	16 2	3 5	16 3	8 53	13 3	9 9	13 3	16.3												
25	4 24	13 3	4 41	13 2	3 20	16 3	3 36	16 2	9 25	13 2	9 42	13 1	17.3												
26	4 58	13 0	5 15	12 11	3 52	16 1	4 9	15 11	9 59	12 11	10 17	12 8	18.3												
27	5 32	12 8	5 50	12 6	4 27	15 9	4 45	15 6	10 35	12 5	10 55	12 1	19.3												
28	6 10	12 3	6 30	12 0	5 4	15 3	5 25	14 11	11 17	11 9	11 40	11 5	20.3												
29	6 52	11 8	7 15	11 4	5 48	14 7	6 12	14 2	—	—	0 3	11 0	21.3												
30	7 42	11 0	8 14	10 7	6 38	13 9	7 8	13 4	0 30	10 7	1 0	10 3	22.3												
31	8 51	10 3	9 31	10 0	7 45	13 0	8 25	12 9	1 36	9 11	2 16	9 9	23.3												
If Mean Spring } Range.				6ft. 8in.	8ft. 2in.				6ft. 7in.																

Equation of Time at Noon.

M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
12 29	Sub.	9	10 38	Sub.	17	8 24	Sub.	25	5 58	Sub.
12 17		10	10 22		18	8 6		26	5 39	
12 4		11	10 6		19	7 48		27	5 21	
11 50		12	9 50		20	7 30		28	5 2	
11 37		13	9 33		21	7 12		29	4 44	
11 23		14	9 16		22	6 54		30	4 26	
11 8		15	8 59		23	6 35		31	4 7	
10 53		16	8 42		24	6 17				

use of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 NORTH SHIELDS add 6 m. LEITH add 12 m. THURSO add 12 m.

MARCH, 1864.

ESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.											
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.													
Mo.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.												
H.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	D.								
430	8	11	31	29	8	2	27	13	5	2	57	13	1	3	26	9	5	3	55	9	2	C	
—	—	0	5	28	11	3	32	12	9	4	12	12	6	4	30	9	0	5	9	8	10	23.7	
4528	5	1	30	28	8	4	58	12	6	5	43	12	9	5	49	8	9	6	32	8	11	24.7	
1829	3	3	0	30	4	6	27	13	0	7	4	13	6	7	14	9	2	7	51	9	5	25.7	
4331	8	4	21	33	3	7	39	14	1	8	8	14	8	8	28	9	9	9	0	10	1	26.7	
5434	11	5	25	36	5	8	33	15	4	8	56	15	11	9	29	10	5	9	56	10	9	27.7	
5237	10	6	18	38	11	9	19	16	5	9	42	16	10	10	18	11	1	10	39	11	5	28.7	
4439	9	7	8	40	5	10	4	17	2	10	25	17	5	11	0	11	7	11	22	11	9	●	
3040	10	7	52	40	11	10	44	17	6	11	4	17	6	11	43	11	10	—	—	—	—	—	1.3
1340	7	8	34	40	1	11	25	17	4	11	46	17	1	0	5	11	9	0	28	11	8	2.3	
5339	5	9	12	38	5	—	—	—	—	0	8	16	9	0	50	11	6	1	12	11	3	3.3	
3137	4	9	48	36	1	0	30	16	3	0	53	15	9	1	33	11	0	1	55	10	8	4.3	
534	8	10	22	33	3	1	15	15	3	1	37	14	8	2	16	10	4	2	37	10	0	5.3	
4031	8	11	0	30	2	2	1	14	1	2	26	13	6	3	0	9	9	3	25	9	5	6.3	
2428	10	11	55	27	8	2	53	12	11	3	24	12	5	3	51	9	1	4	23	8	9	7	8.3
—	—	0	33	26	10	4	1	12	0	4	44	11	9	4	59	8	6	5	37	8	5	8.3	
1426	8	1	59	26	9	5	28	11	10	6	9	11	11	6	17	8	5	6	56	8	6	9.3	
4027	3	3	19	28	0	6	47	12	2	7	21	12	6	7	34	8	8	8	8	8	11	10.3	
5623	11	4	26	29	11	7	51	12	10	8	14	13	3	8	41	9	1	9	6	9	4	11.3	
5331	0	5	16	32	2	8	35	13	8	8	53	14	2	9	29	9	7	9	50	9	10	12.3	
3733	2	5	56	34	1	9	8	14	6	9	23	14	10	10	7	10	0	10	23	10	3	13.3	
1534	10	6	33	35	7	9	39	15	2	9	54	15	5	10	37	10	5	10	52	10	7	14.3	
5036	0	7	5	36	6	10	9	15	7	10	23	15	9	11	6	10	9	11	20	10	10	○	
2236	11	7	39	37	2	10	38	15	11	10	52	16	0	11	36	10	11	11	52	10	11	16.3	
5537	2	8	11	37	1	11	7	15	11	11	22	15	10	—	—	—	0	9	10	11	17.3		
2736	11	8	43	36	8	11	39	15	9	11	58	15	7	0	26	10	10	0	43	10	9	18.3	
5936	3	9	17	35	8	—	—	—	—	0	16	15	4	1	1	10	8	1	19	10	6	19.3	
3435	0	9	52	34	2	0	37	15	1	0	59	14	9	1	39	10	3	1	59	10	1	20.3	
933	3	10	27	32	4	1	22	14	5	1	45	14	0	2	22	9	11	2	45	9	9	21.3	
5031	3	11	18	30	3	2	11	13	8	2	41	13	4	3	10	9	6	3	39	9	4	—	
5129	6	—	—	—	3	17	13	0	—	3	57	12	9	4	16	9	1	4	55	8	11	23.3	
Spring } Tide		18 ^{ft.} 7 ^{in.}				8 ^{ft.} 0 ^{in.}				5 ^{ft.} 6 ^{in.}													

Equation of Time at Noon.

S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
29	Sub.	9	10	38	Sub.	17	8	24	Sub.	25	5	58	Sub.
17		10	10	22		18	8	6		26	5	39	
4		11	10	6		19	7	48		27	5	21	
50		12	9	50		20	7	30		28	5	2	
37		13	9	33		21	7	12		29	4	44	
22		14	9	16		22	6	54		30	4	26	
8		15	8	59		23	6	35		31	4	7	
53		16	8	42		24	6	17					

High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

MARCH, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
Tu.	1	5m45	3 10	8 6	3 39	8 4	0 18	5 11	0 55	5 8	10 3	8 7	10 41	8 1
W.	2	6 41	4 12	8 2	4 50	8 1	1 37	5 7	2 24	5 6	11 21	8 3	—	—
Th	3	7 39	5 31	8 0	6 13	8 1	3 8	5 8	3 51	5 11	0 4	8 3	0 47	8 8
F.	4	8 37	6 59	8 2	7 38	8 3	4 30	6 2	5 1	6 6	1 32	8 7	2 10	8 1
S.	5	9 35	8 13	8 6	8 42	8 9	5 29	6 9	5 54	7 1	2 46	9 5	3 13	9 2
S.	6	10 32	9 7	9 1	9 31	9 5	6 18	7 5	6 42	7 8	3 36	10 5	3 58	10 8
M.	7	11 28	9 55	9 8	10 17	9 10	7 7	7 11	7 31	8 2	4 21	11 5	4 44	11 1
Tu.	8	on 12	10 39	9 11	11 1	10 0	7 54	8 4	8 15	8 6	5 7	12 1	5 31	12 1
W.	9	1 16	11 22	10 0	11 42	10 0	8 35	8 7	8 54	8 6	5 52	12 4	6 12	12 1
Th.	10	2 10	—	—	0 3	9 11	9 15	8 5	9 35	8 3	6 33	12 2	6 55	11 2
F.	11	3 3	0 25	9 10	0 47	9 9	9 54	7 11	10 13	7 8	7 17	11 7	7 38	11 1
S.	12	3 56	1 9	9 7	1 31	9 5	10 33	7 5	10 53	7 1	7 58	10 8	8 16	10 1
S.	13	4 49	1 54	9 2	2 18	9 0	11 16	6 8	11 45	6 4	8 38	9 9	9 2	9 4
M.	14	5 41	2 43	8 9	3 9	8 6	—	—	0 17	5 11	9 31	8 10	10 0	8 8
Tu.	15	6 31	3 35	8 3	4 5	8 1	0 51	5 7	1 30	5 4	10 33	8 2	11 11	7 5
W.	16	7 19	4 40	7 11	5 18	7 10	2 13	5 3	2 55	5 3	11 51	7 9	—	—
Th.	17	8 6	5 58	7 9	6 40	7 9	3 36	5 4	4 14	5 6	0 32	7 9	1 14	7 8
F.	18	8 51	7 19	7 9	7 55	7 11	4 47	5 9	5 16	5 11	1 52	8 0	2 27	8 1
S.	19	9 34	8 26	8 1	8 48	8 3	5 40	6 1	6 0	6 4	2 57	8 7	3 19	8 2
S.	20	10 17	9 8	8 6	9 27	8 9	6 19	6 6	6 37	6 9	3 39	9 3	3 55	9 2
M.	21	10 59	9 43	8 11	9 59	9 0	6 53	6 11	7 10	7 1	4 10	9 11	4 25	10 1
Tu.	22	11 42	10 15	9 2	10 30	9 3	7 27	7 3	7 44	7 5	4 41	10 6	4 57	10 1
W.	23	morn.	10 45	9 4	10 59	9 5	7 59	7 6	8 13	7 7	5 13	10 11	5 28	11 1
Th.	24	0 26	11 15	9 5	11 30	9 5	8 28	7 8	8 43	7 9	5 44	11 2	6 0	11 1
F.	25	1 11	11 45	9 5	—	—	8 57	7 8	9 12	7 7	6 15	11 2	6 31	11 1
S.	26	1 59	0 1	9 5	0 18	9 4	9 28	7 6	9 44	7 4	6 48	10 11	7 6	10 9
S.	27	2 49	0 36	9 3	0 55	9 3	10 0	7 2	10 18	7 0	7 24	10 6	7 42	10 8
M.	28	3 41	1 15	9 2	1 38	9 1	10 38	6 10	11 0	6 7	8 1	9 11	8 23	9 1
Tu.	29	4 36	2 2	8 11	2 27	8 9	11 27	6 4	11 59	6 1	8 46	9 4	9 14	9 6
W.	30	5 32	2 53	8 7	3 23	8 5	—	—	0 37	5 10	9 47	8 9	10 26	8 7
Th.	31	6 28	3 58	8 3	4 36	8 2	1 20	5 8	2 8	5 8	11 6	8 5	11 50	8 6
Half Mean Spring } Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.			
Phases of the Moon.							Moon's Declination at Noon.							
			D. H. M.				M. D. ° ' "				M. D. ° ' "			
Last Quarter-			1	1	11	Afternoon.	1	20	5	23	9	6	N. 14	17
New - - - - -			8	3	59	Morning.	2	20	34	10	10	53	18	14
First Quarter			15	6	7	Morning.	3	19	29	11	14	46	19	11
Full - - - - -			23	10	24	Morning.	4	17	9	12	17	44	20	7
Last Quarter-			30	10	20	Afternoon.	5	13	38	13	19	39	21	3
							6	9	12	14	20	29	22	0
In Perigee - -			7	2	0	Morning.	7	4	10	15	20	18	23	4
In Apogee - -			19	8	0	Morning.	8	1	N. 6	16	19	10	24	8

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—

BELFAST subtract 3 m.

LONDONDERRY add 4 m.

SLIGO BAY add 9 m.

MARCH, 1864.

Month Day.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.	
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.					
	Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.				
	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.	
1	9	19	11	5	9	51	11	0	9	29	9	7	9	56	9	4	9	43	10	7	10	14	10	4	C	
2	10	29	10	9	11	13	10	9	10	29	9	2	11	11	9	0	10	52	10	0	11	31	9	10	23.7	
3	11	59	10	11	—	—	—	—	11	56	9	1	—	—	—	—	—	—	—	—	0	13	9	10	24.7	
4	0	44	11	3	1	22	11	9	0	43	9	4	1	25	9	8	0	55	10	1	1	35	10	4	25.7	
5	1	57	12	5	2	25	13	1	2	6	10	1	2	40	10	6	2	14	10	10	2	51	11	4	26.7	
6	2	52	13	9	3	18	14	5	3	8	11	0	3	36	11	6	3	23	11	10	3	54	12	3	27.7	
7	3	41	15	0	4	3	15	6	4	2	11	11	4	26	12	3	4	21	12	8	4	48	13	0	28.7	
8	4	26	16	0	4	48	16	4	4	50	12	7	5	13	12	9	5	13	13	3	5	36	13	5	●	
9	5	10	16	6	5	32	16	6	5	36	12	10	5	59	12	10	5	57	13	6	6	19	13	6	1.3	
10	5	54	16	4	6	16	16	1	6	21	12	9	6	42	12	7	6	41	13	5	7	3	13	4	2.3	
11	6	37	15	8	6	58	15	2	7	3	12	4	7	23	12	0	7	24	13	1	7	44	12	10	3.3	
12	7	20	14	7	7	40	14	0	7	43	11	8	8	3	11	3	8	4	12	6	8	22	12	2	4.3	
13	8	2	13	4	8	25	12	8	8	22	10	10	8	42	10	4	8	40	11	9	8	59	11	4	5.3	
14	8	49	11	11	9	15	11	2	9	3	9	11	9	25	9	6	9	18	10	11	9	39	10	6	6.3	
15	9	44	10	7	10	19	10	2	9	49	9	1	10	19	8	9	10	7	10	1	10	42	9	8	7.3	
16	10	59	10	0	11	43	10	0	10	58	8	6	11	40	8	6	11	19	9	4	11	58	9	3	8.3	
17	—	—	—	—	0	26	10	1	—	—	—	—	0	24	8	6	—	—	—	—	0	37	9	3	9.3	
18	1	4	10	4	1	39	10	8	1	4	8	8	1	43	8	11	1	15	9	5	1	52	9	8	10.3	
19	2	9	11	2	2	31	11	7	2	18	9	2	2	45	9	6	2	27	9	11	2	56	10	4	11.3	
20	2	53	12	1	3	12	12	6	3	8	9	10	3	30	10	2	3	23	10	7	3	45	10	11	12.3	
21	3	29	12	11	3	45	13	3	3	48	10	6	4	6	10	9	4	6	11	3	4	26	11	6	13.3	
22	4	1	13	8	4	17	14	0	4	23	11	0	4	40	11	3	4	45	11	9	5	3	11	11	14.3	
23	4	32	14	3	4	46	14	6	4	56	11	5	5	11	11	7	5	19	12	1	5	34	12	2	15.3	
24	5	2	14	8	5	19	14	10	5	28	11	8	5	45	11	9	5	49	12	4	6	6	12	5	16.3	
25	5	35	14	9	5	52	14	8	6	2	11	9	6	19	11	9	6	23	12	5	6	40	12	5	17.3	
26	6	9	14	7	6	26	14	5	6	35	11	8	6	52	11	6	6	57	12	4	7	14	12	3	18.3	
27	6	44	14	2	7	4	13	10	7	10	11	4	7	29	11	2	7	31	12	2	7	49	12	0	19.3	
28	7	24	13	6	7	47	13	1	7	48	10	11	8	7	10	8	8	7	11	10	8	26	11	7	20.3	
29	8	10	12	8	8	35	12	2	8	27	10	5	8	49	10	1	8	45	11	4	9	5	11	1	21.3	
30	9	4	11	8	9	37	11	3	9	15	9	9	9	43	9	6	9	29	10	10	10	0	10	6	22.3	
31	10	15	11	0	10	58	11	0	10	16	9	4	10	57	9	3	10	38	10	3	11	17	10	1	23.3	
Half Mean Spring } 7ft. 5in. Range.									5ft. 10in.									6ft. 2in.								

Equation of Time at Noon.

M. D.	M.	S.		M. D.	M.	S.		M. D.	M.	S.		M. D.	M.	S.	
1	12	29	Sub.	9	10	38	Sub.	17	8	24	Sub.	25	5	58	Sub.
2	12	17		10	10	22		18	8	6		26	5	39	
3	12	4		11	10	6		19	7	48		27	5	21	
4	11	50		12	9	50		20	7	50		28	5	2	
5	11	37		13	9	33		21	7	12		29	4	44	
6	11	22		14	9	16		22	6	54		30	4	26	
7	11	8		15	8	59		23	6	35		31	4	7	
8	10	53		16	8	42		24	6	17					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
 GALWAY *add* 11 m. | QUEENSTOWN *add* 8 m. | WATERFORD *add* 8 m.

APRIL, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTN.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
F.	1	7 m 25	6 12	8 4	6 55	8 4	5 34	20 5	6 22	20 8	—	—	0 3	—
S.	2	8 20	7 38	8 6	8 18	8 8	7 8	21 3	7 46	22 0	1 23	16 4	1	2
M.	3	9 14	8 54	8 11	9 25	9 2	8 22	22 11	8 50	23 10	2 47	17 9	3 2	—
Tu.	4	10 7	9 53	9 5	10 20	9 7	9 16	24 9	9 40	25 7	3 51	19 7	4 2	—
W.	5	11 1	10 45	9 9	11 10	9 11	10 2	26 4	10 25	26 10	4 47	21 1	5 1	—
Th.	6	11 54	11 35	10 0	11 59	10 1	10 49	27 3	11 11	27 6	5 40	22 1	6	—
F.	7	OR 48	—	—	0 21	10 2	11 33	27 9	11 55	27 8	6 25	22 6	6 4	—
S.	8	1 42	0 43	10 2	1 4	10 2	—	—	0 16	27 6	7 5	22 4	7 2	—
M.	9	2 36	1 25	10 1	1 46	9 11	0 36	27 1	0 56	26 7	7 46	21 6	8	—
Tu.	10	3 30	2 6	9 10	2 25	9 8	1 15	25 11	1 35	25 2	8 26	20 4	8 4	—
W.	11	4 22	2 44	9 5	3 4	9 3	1 55	24 5	2 15	23 6	9 6	18 11	9 2	—
Th.	12	5 12	3 24	9 0	3 46	8 10	2 35	22 7	2 57	21 10	9 46	17 5	10	—
F.	13	6 0	4 9	8 7	4 35	8 5	3 20	20 11	3 47	20 3	10 30	16 0	10 5	—
S.	14	6 46	5 4	8 3	5 35	8 1	4 19	19 7	4 53	19 2	11 22	14 10	11 5	—
M.	15	7 30	6 11	8 0	6 48	7 11	5 34	19 0	6 15	19 1	—	—	0 2	—
Tu.	16	8 13	7 26	7 11	8 1	8 1	6 56	19 5	7 30	19 10	1 9	14 9	1 4	—
W.	17	8 55	8 35	8 3	9 5	8 5	8 3	20 5	8 32	21 0	2 26	15 7	2 5	—
Th.	18	9 38	9 30	8 7	9 53	8 9	8 54	21 8	9 16	22 4	3 25	16 9	3 5	—
F.	19	10 21	10 14	8 11	10 33	9 0	9 34	23 0	9 52	23 7	4 13	18 1	4 3	—
S.	20	11 6	10 51	9 2	11 9	9 3	10 8	24 1	10 24	24 7	4 54	19 2	5 1	—
M.	21	11 54	11 29	9 4	11 48	9 5	10 44	24 11	11 0	25 2	5 33	20 0	5 5	—
Tu.	22	morn.	—	—	0 7	9 6	11 18	25 6	11 37	25 8	6 10	20 6	6 2	—
W.	23	0 44	0 26	9 7	0 44	9 8	11 56	25 9	—	—	6 46	20 10	7	—
Th.	24	1 36	1 3	9 8	1 22	9 8	0 14	25 9	0 33	25 9	7 22	20 9	7 4	—
F.	25	2 31	1 41	9 8	1 59	9 7	0 51	25 6	1 10	25 3	8 0	20 4	8 2	—
S.	26	3 28	2 19	9 6	2 40	9 5	1 30	24 10	1 50	24 5	8 42	19 8	9	—
M.	27	4 24	3 2	9 4	3 26	9 2	2 13	23 10	2 37	23 3	9 28	18 8	9 5	—
Tu.	28	5 20	3 52	9 1	4 20	8 11	3 3	22 9	3 31	22 2	10 17	17 9	10 4	—
W.	29	6 14	4 51	8 10	5 26	8 8	4 4	21 7	4 42	21 3	11 14	16 9	11 4	—
Th.	30	7 8	6 2	8 7	6 40	8 7	5 23	21 2	6 5	21 5	—	—	0 2	—

Half Mean Spring }
Range.

4 ft. 10 in.

13 ft. 0 in.

10 ft. 6 in.

Phases of the Moon.

	D.	H.	M.	
New	6	1	49	Afternoon.
First Quarter	14	0	9	Morning.
Full	22	1	19	Morning.
Last Quarter	29	4	34	Morning.
In Perigee	4	6	0	Morning.
In Apogee	16	2	0	Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	14	N. 44	9	18	N. 51	17	4	N. 42	25		
2	10	45	10	20	8	18	0	34	26		
3	6	6	11	20	18	19	3	S. 39	27		
4	1	3	12	19	28	20	7	47	28		
5	4	N. 3	13	17	44	21	11	39	29		
6	8	52	14	15	16	22	15	4	30		
7	13	6	15	13	10	23	17	47			
8	16	29	16	8	37	24	19	35			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required

GREENOCK add 19 m.

LIVERPOOL add 12 m.

PEMBROKE add 26 m.

APRIL, 1864.

DOVER.					SHEERNESS.					LONDON.					C's AGE AT NOON.
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			
Time.	Height.	Time.	Height.		Time.	Height.	Time.	Height.		Time.	Height.	Time.	Height.		
H. M. F. I.		H. M. F. I.			H. M. F. I.		H. M. F. I.			H. M. F. I.		H. M. F. I.		D	
5 20 14 9		6 0 14 10			6 50 13 2		7 34 13 3			8 15 16 3		9 2 16 2		24.3	
6 39 15 2		7 19 15 9			8 20 13 5		9 4 13 9			9 45 16 2		10 30 16 5		25.3	
7 57 16 5		8 28 17 1			9 43 14 2		10 18 14 8			11 12 16 9		11 46 17 2		26.3	
8 56 17 9		9 23 18 4			10 47 15 2		11 14 15 7			— — — —		0 17 17 8		27.3	
9 48 18 10		10 13 19 3			11 37 16 0		12 0 16 4			0 44 18 2		1 8 18 8		28.3	
10 38 19 8		11 2 19 10			— — — —		0 23 16 8			1 33 19 1		1 54 19 6	●		
11 26 19 11		11 49 19 11			0 47 16 10		1 10 17 0			2 15 19 9		2 38 20 0		0.9	
— — — —		0 11 19 9			1 30 17 1		1 51 17 0			2 59 20 1		3 20 20 1		1.9	
0 33 19 6		0 56 19 2			2 10 16 10		2 30 16 7			3 41 20 0		4 0 19 10		2.9	
1 18 18 9		1 39 18 4			2 50 16 4		3 8 16 0			4 21 19 7		4 40 19 3		3.9	
1 59 17 11		2 31 17 3			3 28 15 8		3 48 15 3			4 59 18 10		5 19 18 5		4.9	
2 43 16 7		3 4 16 0			4 9 14 9		4 31 14 3			5 40 17 11		6 2 17 5		5.9	
3 26 15 5		3 52 14 11			4 53 13 10		5 18 13 5			6 25 17 0		6 50 16 6		6.9	
4 18 14 4		4 46 13 11			5 47 13 1		6 19 12 9			7 15 16 1		7 47 15 9	☾		
5 19 13 8		5 52 13 8			6 54 12 7		7 34 12 6			8 22 15 6		9 1 15 4		8.9	
6 27 13 10		7 2 14 2			8 14 12 7		8 52 12 10			9 40 15 4		10 17 15 5		9.9	
7 37 14 7		8 8 15 1			9 27 13 1		10 0 13 5			10 53 15 7		11 27 15 10		10.9	
8 32 15 6		8 55 16 0			10 28 13 9		10 51 14 11			11 57 16 2		— — — —		11.9	
9 16 16 5		9 35 16 10			11 14 14 5		11 32 14 8			0 21 16 6		0 42 16 10		12.9	
9 54 17 3		10 12 17 7			11 50 15 0		— — — —			1 1 17 3		1 19 17 7		13.9	
10 31 17 10		10 50 18 1			0 7 15 3		0 23 15 6			1 38 17 11		1 54 18 2		14.9	
11 9 18 4		11 30 18 5			0 41 15 8		0 59 15 10			2 12 18 5		2 28 18 8	○		
11 50 18 6		— — — —			1 16 16 0		1 34 16 1			2 46 18 10		3 3 19 0		16.9	
0 10 18 6		0 30 18 6			1 52 16 0		2 9 15 11			3 21 19 1		3 38 19 1		17.9	
0 50 18 5		1 11 18 3			2 27 15 11		2 44 15 10			3 57 19 1		4 15 18 11		18.9	
1 33 18 1		1 55 17 11			3 3 15 8		3 23 15 6			4 34 18 10		4 56 18 8		19.9	
2 19 17 6		2 44 17 1			3 44 15 3		4 7 14 11			5 15 18 5		5 38 18 1		20.9	
3 10 16 8		3 37 16 3			4 33 14 7		5 0 14 4			6 3 17 10		6 31 17 6		21.9	
4 7 15 10		4 38 15 6			5 30 14 1		6 4 13 9			6 59 17 2		7 32 16 11	☾		
5 11 15 4		5 45 15 4			6 43 13 6		7 23 13 7			8 9 16 8		8 50 16 7		23.9	
Mean Spring } 9ft. 4in. Range.					8ft. 0in.					9ft. 7in.					

Equation of Time at Noon.

M. S.		M. D.	M. S.		M. D.	M. S.		M. D.	M. S.	
3 49	Sub.	9	1 30	Sub.	17	0 33	Add.	25	2 12	Add.
3 31		10	1 14		18	0 47		26	2 22	
3 13		11	0 57		19	1 0		27	2 31	
2 56		12	0 42		20	1 13		28	2 41	
2 38		13	0 26		21	1 26		29	2 49	
2 21		14	0 11		22	1 38		30	2 57	
2 4		15	0 4	Add.	23	1 50				
1 47		16	0 19		24	2 1				

es of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

APRIL, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.
F.	1	7m25	5 17 8 2	5 58 8 2	2 54 5 9	3 36 6 0	—	—	—	—	—	—	—	—
S.	2	8 20	6 40 8 3	7 18 8 4	4 13 6 4	4 43 6 7	1 14 8 10	1 5.						
M.	3	9 14	7 52 8 6	8 20 8 10	5 9 6 10	5 33 7 2	2 25 9 6	2 50						
M.	4	10 7	8 45 9 1	9 9 9 4	5 56 7 5	6 20 7 8	3 16 10 5	3 38						
Tu.	5	11 1	9 32 9 6	9 55 9 8	6 43 7 10	7 7 8 0	3 59 11 3	4 21						
W.	6	11 54	10 18 9 9	10 40 9 10	7 31 8 2	7 54 8 3	4 44 11 9	5 8						
Th.	7	12 48	11 0 9 10	11 20 9 10	8 14 8 4	8 33 8 3	5 30 12 1	5 50						
F.	8	1 42	11 39 9 9	11 59 9 8	8 51 8 2	9 10 8 0	6 9 11 10	6 25						
S.	9	2 36	—	—	0 20 9 6	9 29 7 9	9 48 7 6	6 50 11 4	7 1					
M.	10	3 30	0 42 9 5	1 4 9 3	10 7 7 3	10 27 6 11	7 31 10 6	7 51						
M.	11	4 22	1 26 9 1	1 49 8 11	10 49 6 7	11 14 6 3	8 11 9 8	8 34						
Tu.	12	5 12	2 14 8 8	2 39 8 6	11 43 6 0	—	8 58 8 10	9 27						
W.	13	6 0	3 4 8 3	3 34 8 2	0 15 5 8	0 53 5 5	10 0 8 3	10 35						
Th.	14	6 46	4 6 8 0	4 40 7 11	1 33 5 4	2 14 5 3	11 11 7 11	11 45						
F.	15	7 30	5 16 7 10	5 51 7 10	2 54 5 4	3 29 5 6	—	0 25						
S.	16	8 13	6 28 7 10	7 2 7 11	4 2 5 8	4 31 5 11	1 2 8 0	1 35						
M.	17	8 55	7 35 8 0	8 2 8 2	4 57 6 1	5 19 6 3	2 7 8 5	2 35						
M.	18	9 38	8 24 8 4	8 46 8 6	5 38 6 5	5 57 6 7	2 56 9 0	3 17						
Tu.	19	10 21	9 4 8 9	9 22 8 11	6 14 6 9	6 32 6 11	3 34 9 8	3 50						
W.	20	11 6	9 39 9 1	9 55 9 2	6 50 7 1	7 8 7 3	4 5 10 3	4 21						
Th.	21	11 54	10 12 9 3	10 30 9 4	7 26 7 4	7 44 7 6	4 39 10 9	4 57						
F.	22	morn.	10 47 9 5	11 5 9 5	8 0 7 7	8 18 7 8	5 15 11 1	5 33						
S.	23	0 44	11 21 9 5	11 38 9 4	8 34 7 8	8 50 7 7	5 51 11 2	6 8						
M.	24	1 36	11 56 9 4	—	9 7 7 6	9 24 7 5	6 26 11 0	6 45						
M.	25	2 31	0 16 9 4	0 36 9 3	9 43 7 3	10 2 7 1	7 5 10 8	7 26						
Tu.	26	3 28	0 58 9 2	1 22 9 1	10 23 6 11	10 46 6 9	7 47 10 1	8 5						
W.	27	4 24	1 47 9 0	2 16 8 10	11 16 6 6	11 51 6 3	8 36 9 6	9 6						
Th.	28	5 20	2 46 8 8	3 17 8 6	—	0 29 6 0	9 40 9 0	10 18						
F.	29	6 14	3 51 8 5	4 29 8 5	1 12 5 11	2 0 5 11	10 59 8 9	11 40						
S.	30	7 8	5 7 8 4	5 44 8 4	2 44 6 0	3 22 6 3	—	0 17						

Half Mean Spring }
Range.

4ft. 9in.

3ft. 10in.

5ft. 7in.

Phases of the Moon.

	D.	H. M.	
New - - - - -	6	1 49	Afternoon.
First Quarter -	14	0 9	Morning.
Full - - - - -	22	1 19	Morning.
Last Quarter -	29	4 34	Morning.
In Perigee - -	4	6 0	Morning.
In Apogee - -	16	2 0	Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	14	8.44	9	18	N.51	17	4	N.42	25	2	
2	10	45	10	20	8	18	0	34	26	1	
3	6	6	11	20	18	19	3	8.39	27	1	
4	1	3	12	19	28	20	7	47	28	1	
5	4	N.3	13	17	44	21	11	39	29	1	
6	8	52	14	15	16	22	15	4	30		
7	13	6	15	12	10	23	17	47			
8	16	29	16	8	37	24	19	35			

The times for High Water are given for Mean Time at Place ; if Dublin or Railway Time be required
 BELFAST subtract 3 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

APRIL, 1864.

NORTH SHIELDS.					LEITH.					THURSO.					C's AGE AT NOON.
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			
Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.		Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.		Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.		
10 17 10 1		11 0 10 3			9 10 12 9		9 55 12 11			3 2 9 8		3 52 9 10		24'3	
11 42 10 7		—			10 35 13 3		11 11 13 8			4 35 10 0		5 13 10 4		25'3	
0 18 11 0		0 50 11 6			11 44 14 2		—			5 46 10 10		6 13 11 5		26'3	
1 17 11 11		1 42 12 5			0 11 14 9		0 36 15 4			6 36 12 1		6 58 12 9		27'3	
2 6 12 11		2 28 13 4			1 0 15 11		1 23 16 5			7 17 13 4		7 37 13 10		28'3	
2 49 13 8		3 11 14 0			1 46 16 10		2 9 17 2			7 58 14 2		8 19 14 4		29'3	
3 33 14 2		3 54 14 3			2 32 17 4		2 52 17 5			8 39 14 5		8 59 14 3		30'9	
4 15 14 2		4 35 14 0			3 11 17 4		3 30 17 11			9 19 14 1		9 40 13 10		31'9	
4 56 13 8		5 17 13 4			3 50 16 10		4 11 16 5			10 1 13 5		10 22 13 0		32'9	
5 38 13 0		5 59 12 7			4 32 16 0		4 53 15 7			10 43 12 6		11 5 12 0		33'9	
6 19 12 3		6 41 11 9			5 14 15 2		5 36 14 8			11 28 11 5		11 51 10 10		34'9	
7 3 11 3		7 27 10 10			6 0 14 1		6 24 13 6			—		0 15 10 5		35'9	
7 54 10 3		8 26 9 10			6 49 13 0		7 21 12 7			0 41 9 11		1 11 9 6		36'9	
9 0 9 6		9 37 9 4			7 54 12 3		8 29 12 0			1 45 9 2		2 21 8 11		37'9	
10 17 9 4		10 54 9 5			9 10 11 11		9 48 12 0			3 3 8 10		3 45 8 10		38'9	
11 30 9 7		—			10 23 12 2		10 56 12 4			4 23 8 11		4 57 9 1		39'9	
0 3 9 10		0 34 10 2			11 27 12 8		11 54 13 0			5 29 9 4		5 56 9 9		40'9	
1 0 10 5		1 22 10 9			—		0 16 13 5			6 18 10 2		6 38 10 7		41'9	
1 43 11 1		2 1 11 5			0 37 13 10		0 54 14 3			6 55 11 1		7 10 11 6		42'9	
2 18 11 9		2 34 12 1			1 12 14 8		1 29 15 1			7 23 12 0		7 37 12 5		43'9	
2 49 12 5		3 5 12 8			1 46 15 5		2 3 15 8			7 52 12 8		8 8 12 11		44'9	
3 22 12 10		3 39 13 0			2 21 15 11		2 38 16 1			8 25 13 1		8 43 13 2		45'9	
3 57 13 1		4 15 13 1			2 55 16 2		3 12 16 2			9 0 13 2		9 18 13 1		46'9	
4 34 13 0		4 53 12 11			3 29 16 1		3 47 15 11			9 37 13 0		9 56 12 10		47'9	
5 12 12 9		5 31 12 7			4 6 15 9		4 26 15 7			10 16 12 7		10 38 12 4		48'9	
5 53 12 5		6 15 12 3			4 48 15 5		5 10 15 2			11 1 12 0		11 26 11 8		49'9	
6 39 11 11		7 5 11 8			5 34 14 10		6 2 14 6			11 54 11 3		—		50'9	
7 35 11 3		8 7 10 11			6 31 14 1		7 2 13 9			0 23 10 11		0 54 10 8		51'9	
8 43 10 8		9 24 10 6			7 38 13 5		8 18 13 3			1 28 10 4		2 9 10 3		52'9	
10 7 10 6		10 45 10 8			8 59 13 3		9 40 13 5			2 51 10 2		3 36 10 3		53'9	
Mean Spring } 6ft. 8in. Range.					8ft. 2in.					6ft. 7in.					

Equation of Time at Noon.

M. S.		M.D.	M. S.		M.D.	M. S.		M.D.	M. S.	
3 49	Sub.	9	1 30	Sub.	17	0 33	Add.	25	2 12	Add.
3 31		10	1 14		18	0 47		26	2 22	
3 13		11	0 57		19	1 0		27	2 31	
2 56		12	0 42		20	1 13		28	2 41	
2 38		13	0 26		21	1 26		29	2 49	
2 21		14	0 11		22	1 38		30	2 57	
2 4		15	0 4	Add.	23	1 50				
1 47		16	0 19		24	2 1				

Notes of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required—for
 NORTH SHIELDS add 9 m. LEITH add 13 m. THURSO add 14 m.

MAY, 1864.

Week Day.	Month Day.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.																		
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.																
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.															
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.															
S.	1	8 mo	11 42	15 7	—	—	0 35	13 4	1 17	13 0	6 52	10 8	7 39	1															
M.	2	8 51	0 15	16 1	0 45	16 8	1 55	13 11	2 32	13 10	8 4	11 4	8 36	1															
Tu.	3	9 43	1 15	17 3	1 40	17 10	3 3	14 9	3 30	14 8	9 7	12 0	9 34	1															
W.	4	10 35	2 5	18 5	2 30	18 11	3 57	15 3	4 23	15 3	10 0	12 5	10 26	1															
Th.	5	11 28	2 53	19 3	3 15	19 6	4 48	15 7	5 12	15 8	10 49	12 9	11 11	1															
F.	6	0 23	3 36	19 6	3 58	19 5	5 33	15 9	5 54	15 9	11 32	12 10	11 54	1															
S.	7	1 17	4 20	19 3	4 40	19 0	6 15	15 8	6 36	15 8	—	—	0 17	1															
S.	8	2 10	4 59	18 8	5 19	18 3	6 54	15 4	7 12	15 5	0 39	12 7	0 59	1															
M.	9	3 2	5 37	17 10	5 57	17 5	7 30	14 9	7 47	14 10	1 19	12 3	1 39	1															
Tu.	10	3 52	6 18	16 11	6 39	16 3	8 5	14 0	8 23	14 2	1 58	11 10	2 20	1															
W.	11	4 39	6 59	15 8	7 22	15 1	8 40	13 2	8 58	13 5	2 40	11 4	3 0	1															
Th.	12	5 24	7 45	14 6	8 9	14 1	9 18	12 5	9 40	12 8	3 21	10 10	3 43	1															
F.	13	6 8	8 36	13 8	9 4	13 5	10 3	11 9	10 30	12 1	4 6	10 5	4 33	1															
S.	14	6 50	9 37	13 4	10 11	13 4	10 57	11 4	11 32	11 11	5 0	10 0	5 30	1															
S.	15	7 32	10 46	13 6	11 18	13 9	—	—	0 9	11 6	6 3	9 10	6 35	1															
M.	16	8 15	11 50	14 1	—	—	0 45	12 2	1 20	12 1	7 7	10 0	7 58	1															
Tu.	17	8 59	0 20	14 6	0 46	14 11	1 54	12 10	2 26	12 10	8 8	10 6	8 37	1															
W.	18	9 45	1 12	15 5	1 35	16 0	2 53	13 6	3 20	13 7	9 3	11 0	9 27	1															
Th.	19	10 34	1 56	16 6	2 16	17 0	3 43	14 0	4 6	14 3	9 50	11 7	10 11	1															
F.	20	11 27	2 35	17 6	2 55	18 0	4 29	14 6	4 51	14 9	10 31	12 0	10 51	1															
S.	21	morn.	3 16	18 4	3 37	18 7	5 11	14 11	5 31	15 3	11 12	12 3	11 33	1															
S.	22	0 22	3 59	18 9	4 20	18 10	5 52	15 3	6 13	15 7	11 55	12 6	—	1															
M.	23	1 19	4 39	18 11	4 59	18 10	6 34	15 4	6 54	15 8	0 16	12 6	0 38	1															
Tu.	24	2 17	5 21	18 8	5 43	18 7	7 14	15 2	7 34	15 7	0 59	12 6	1 21	1															
W.	25	3 15	6 6	18 4	6 31	18 0	7 56	14 10	8 19	15 3	1 44	12 4	2 7	1															
Th.	26	4 11	6 56	17 6	7 24	17 0	8 42	14 5	9 7	14 9	2 32	12 2	2 58	1															
F.	27	5 5	7 54	16 6	8 24	16 0	9 34	13 10	10 1	14 1	3 24	11 9	3 52	1															
S.	28	5 57	8 55	15 8	9 26	15 5	10 29	13 2	11 1	13 7	4 21	11 4	4 51	1															
S.	29	6 48	10 1	15 5	10 37	15 6	11 33	12 10	—	—	5 21	11 0	5 54	1															
M.	30	7 38	11 12	15 7	11 45	15 10	0 11	13 5	0 51	13 1	6 27	10 10	7 0	1															
T.	31	8 29	—	—	0 16	16 1	1 28	13 9	2 3	13 7	7 33	11 1	8 0	1															
Half Mean Spring } Range.			9 ⁿ . 6 ⁱⁿ .				7 ⁿ . 9 ⁱⁿ .				6 ⁿ . 4 ⁱⁿ .																		
Phases of the Moon.															Moon's Declination at Noon.														
D. H. M.															M.D. ° ' "														
New - - - - - 6 0 14 Morning.															1 28. 33 9 19 N. 50 17 6 S. 23 25														
First Quarter - 13 6 21 Afternoon.															2 2N. 24 10 18 24 18 10 21 26														
Full - - - - - 21 1 24 Afternoon.															3 7 13 11 16 8 19 13 57 27														
Last Quarter - 28 9 21 Morning.															4 11 35 12 13 13 20 16 57 28														
In Perigee - - 1 11 0 Morning.															5 15 16 13 9 48 21 19 7 29														
In Apogee - - 13 9 0 Afternoon.															6 18 1 14 6 0 22 20 13 30														
In Perigee - - 26 0 0 Noon.															7 19 43 15 1 57 23 20 7 31														
															8 20 19 16 2 S. 14 24 18 44														

The times of High Water are given for Mean Time at Place, if Greenwich or Railway Time be required
 BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 16 m.

APRIL, 1864.

Month Day.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's Age at Noon.
	MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	Time. H. M. F. I.	Height. F. I.	
1	0 31 29	2	1 14 29	6	4 43 12	9	5 28 13	0	5 35 11	11	6 17 9	1	24' 3
2	1 59 30	0	2 40 30	11	6 9 13	4	6 45 13	9	6 56 9	3	7 32 9	7	25' 3
3	3 20 32	2	3 56 33	5	7 18 14	3	7 46 14	9	8 7 9	10	8 37 10	2	26' 3
4	4 30 34	10	5 1 36	2	8 12 15	4	8 36 15	10	9 6 10	6	9 34 10	9	27' 3
5	5 28 37	4	5 55 38	3	8 58 16	3	9 19 16	7	9 57 11	0	10 19 11	3	28' 3
6	6 21 39	0	6 45 39	4	9 42 16	10	10 5 17	0	10 40 11	5	11 1 11	6	0' 9
7	7 7 39	7	7 29 39	8	10 24 17	1	10 42 17	0	11 21 11	7	11 42 11	6	0' 9
8	7 49 39	4	8 9 38	11	11 1 16	10	11 20 16	7	—	—	0 3 11	5	1' 9
9	8 29 38	3	8 48 37	5	11 41 16	3	—	—	0 24 11	3	0 45 11	0	2' 9
10	9 6 36	6	9 24 35	6	0 3 15	11	0 25 15	6	1 6 10	9	1 28 10	6	3' 9
11	9 41 34	3	9 59 32	11	0 47 15	0	1 10 14	5	1 48 10	3	2 10 9	11	4' 9
12	10 16 31	9	10 34 30	6	1 33 13	11	1 57 13	5	2 33 9	8	2 56 9	5	5' 9
13	10 57 29	5	11 24 28	5	2 22 13	0	2 52 12	7	3 21 9	2	3 51 8	11	6' 9
14	11 55 27	7	—	—	3 26 12	3	4 2 12	0	4 24 8	8	4 59 8	6	7' 9
15	0 31 27	2	1 8 27	2	4 43 11	11	5 21 12	0	5 35 8	5	6 10 8	6	8' 9
16	1 47 27	5	2 23 27	11	5 57 12	3	6 30 12	6	6 44 8	8	7 17 8	10	9' 9
17	2 58 28	7	3 32 29	5	7 1 12	9	7 28 13	1	7 48 9	0	8 17 9	3	10' 9
18	4 0 30	4	4 28 31	3	7 50 13	5	8 12 13	10	8 42 9	5	9 5 9	8	11' 9
19	4 52 32	4	5 15 33	3	8 30 14	3	8 47 14	7	9 27 9	10	9 46 10	1	12' 9
20	5 35 34	2	5 54 34	11	9 3 14	11	9 19 15	2	10 3 10	3	10 18 10	5	13' 9
21	6 14 35	6	6 33 35	11	9 36 15	5	9 54 15	7	10 34 10	7	10 51 10	9	14' 9
22	6 52 36	4	7 12 36	8	10 10 15	9	10 27 15	10	11 8 10	10	11 26 10	11	15' 9
23	7 30 36	11	7 48 36	11	10 43 15	11	11 0 15	10	11 43 10	11	—	—	16' 9
24	8 6 36	11	8 24 36	8	11 17 15	9	11 37 15	8	0 2 10	10	0 21 10	9	17' 9
25	8 42 36	5	9 1 36	0	11 57 15	6	—	—	0 40 10	11	1 0 10	7	18' 9
26	9 20 35	7	9 40 34	9	0 19 15	3	0 43 15	0	1 22 10	5	1 44 10	3	19' 9
27	10 1 33	11	10 22 33	1	1 8 14	8	1 35 14	4	2 8 10	0	2 35 9	10	20' 9
28	10 45 32	3	11 12 31	4	2 4 14	0	2 35 13	8	3 3 9	11	3 33 9	6	21' 9
29	11 46 30	9	—	—	3 9 13	5	3 50 13	3	4 8 9	4	4 48 9	3	22' 9
30	0 22 30	5	0 59 30	6	4 32 13	3	5 13 13	5	5 26 9	2	6 3 9	3	23' 9

Half Moon Spring } 18 ft. 7 in.
Range.

8 ft. 0 in.

5 ft. 6 in.

Equation of Time at Noon.

M. D.	M. S.		M. D.	M. S.		M. D.	M. S.		M. D.	M. S.	
1	3 49	Sub.	9	1 30	Sub.	17	0 33	Add.	25	2 12	Add.
2	3 31		10	1 14		18	0 47		26	2 22	
3	3 13		11	0 57		19	1 0		27	2 31	
4	2 56		12	0 42		20	1 13		28	2 41	
5	2 38		13	0 26		21	1 26		29	2 49	
6	2 21		14	0 11		22	1 38		30	2 57	
7	2 4		15	0 4	Add.	23	1 50				
8	1 47		16	0 19		24	2 1				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 WESTON-SUPER-MARE add 18 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

APRIL, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY																
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.														
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.													
		H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.														
F.	1	7m25	5 17 8 2	5 58 8 2	2 54 5 9	3 36 6 0	—	—	0 31																		
S.	2	8 20	6 40 8 3	7 18 8 4	4 13 6 4	4 43 6 7	1 14 8 10	1 51																			
M.	3	9 14	7 52 8 6	8 20 8 10	5 9 6 10	5 33 7 2	2 25 9 6	2 51																			
Tu.	4	10 7	8 45 9 1	9 9 9 4	5 56 7 5	6 20 7 8	3 16 10 5	3 38																			
W.	5	11 1	9 32 9 6	9 55 9 8	6 43 7 10	7 7 8 0	3 59 11 3	4 21																			
Th.	6	11 54	10 18 9 9	10 40 9 10	7 31 8 2	7 54 8 3	4 44 11 9	5 6																			
F.	7	on 48	11 0 9 10	11 20 9 10	8 14 8 4	8 33 8 3	5 30 12 1	5 50																			
S.	8	1 42	11 39 9 9	11 59 9 8	8 51 8 2	9 10 8 0	6 9 11 10	6 29																			
M.	9	2 36	—	0 20 9 6	9 29 7 9	9 48 7 6	6 50 11 4	7 1																			
Tu.	10	3 30	0 42 9 5	1 4 9 3	10 7 7 3	10 27 6 11	7 31 10 6	7 51																			
W.	11	4 22	1 26 9 1	1 49 8 11	10 49 6 7	11 14 6 3	8 11 9 8	8 34																			
Th.	12	5 12	2 14 8 8	2 39 8 6	11 43 6 0	—	8 58 8 10	9 27																			
F.	13	6 0	3 4 8 3	3 34 8 2	0 15 5 8	0 53 5 5	10 0 8 3	10 35																			
S.	14	6 46	4 6 8 0	4 40 7 11	1 33 5 4	2 14 5 3	11 11 7 11	11 49																			
M.	15	7 30	5 16 7 10	5 51 7 10	2 54 5 4	3 29 5 6	—	0 25																			
Tu.	16	8 13	6 28 7 10	7 2 7 11	4 2 5 8	4 31 5 11	1 2 8 0	1 35																			
W.	17	8 55	7 35 8 0	8 2 8 2	4 57 6 1	5 19 6 3	2 7 8 5	2 35																			
Th.	18	9 38	8 24 8 4	8 46 8 6	5 38 6 5	5 57 6 7	2 56 9 0	3 17																			
F.	19	10 21	9 4 8 9	9 22 8 11	6 14 6 9	6 32 6 11	3 34 9 8	3 50																			
S.	20	11 6	9 39 9 1	9 55 9 2	6 50 7 1	7 8 7 3	4 5 10 3	4 21																			
M.	21	11 54	10 12 9 3	10 30 9 4	7 26 7 4	7 44 7 6	4 39 10 9	4 57																			
Tu.	22	morn.	10 47 9 5	11 5 9 5	8 0 7 7	8 18 7 8	5 15 11 1	5 33																			
W.	23	0 44	11 21 9 5	11 38 9 4	8 34 7 8	8 50 7 7	5 51 11 2	6 8																			
Th.	24	1 36	11 56 9 4	—	9 7 7 6	9 24 7 5	6 26 11 0	6 45																			
F.	25	2 31	0 16 9 4	0 36 9 3	9 43 7 3	10 2 7 1	7 5 10 8	7 26																			
S.	26	3 28	0 58 9 2	1 22 9 1	10 23 6 11	10 46 6 9	7 47 10 1	8 9																			
M.	27	4 24	1 47 9 0	2 16 8 10	11 16 6 6	11 51 6 3	8 36 9 6	9 6																			
Tu.	28	5 20	2 46 8 8	3 17 8 6	—	0 29 6 0	9 40 9 0	10 18																			
W.	29	6 14	3 51 8 5	4 29 8 5	1 12 5 11	2 0 5 11	10 59 8 9	11 40																			
Th.	30	7 8	5 7 8 4	5 44 8 4	2 44 6 0	3 22 6 3	—	0 17																			
Half Mean Spring Range.			4 ⁿ . 9 ⁿ .				3 ⁿ . 10 ⁿ .				5 ⁿ . 7 ⁿ .																
Phases of the Moon.													Moon's Declination at Noon.														
													M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'			
New - - - - -													6	1	49	Afternoon.	1	14	8.44	9	18	N.51	17	4	N.42	25	2
First Quarter -													14	0	9	Morning.	2	10	45	10	20	8	18	0	34	26	10
Full - - - - -													22	1	19	Morning.	3	6	6	11	20	18	19	3	38.39	27	18
Last Quarter -													29	4	34	Morning.	4	1	3	12	19	28	20	7	47	28	11
In Perigee - -													4	6	0	Morning.	5	4	N.3	13	17	44	21	11	39	29	11
In Apogee - -													16	2	0	Morning.	6	8	52	14	15	16	22	15	4	30	
													7	13	6	15	12	10	23	17	47						
													8	16	29	16	8	37	24	19	35						

Times for High Water are given for Mean Time at Place; if Dublin or Railway Time be required
 BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

APRIL, 1864.

GALWAY.					QUEENSTOWN.					WATERFORD.					C's AGE AT NOON.
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			
Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.	
11 43 11 3	— —	— —	— —		11 40 9 4	— —	— —	— —		11 58 10 1	— —	— —	— —	24'3	
0 26 11 7	1 3 12 0	0 24 9 6	1 4 9 10		0 37 10 3	1 15 10 7	2 27 11 4	2 27 11 4		3 30 12 2	4 24 12 10	5 14 13 1	5 14 13 1	25'3	
1 36 12 7	2 3 13 3	1 44 10 2	2 16 10 7		1 52 10 11	2 27 11 4	3 30 12 2	3 30 12 2		4 24 12 10	5 14 13 1	5 56 13 2	5 56 13 2	26'3	
2 30 13 10	2 56 14 4	2 45 11 0	3 14 11 5		3 0 11 9	3 30 12 2	4 24 12 10	4 24 12 10		5 14 13 1	5 56 13 2	6 38 12 11	6 38 12 11	27'3	
3 19 14 10	3 42 15 3	3 39 11 9	4 4 12 1		3 57 12 6	4 24 12 10	5 14 13 1	5 14 13 1		6 38 12 11	7 18 12 6	8 35 11 3	8 35 11 3	28'3	
4 5 15 7	4 27 15 9	4 28 12 3	4 51 12 5		4 51 13 0	5 14 13 1	6 38 12 11	6 38 12 11		7 18 12 6	8 35 11 3	9 13 10 7	9 13 10 7	29'3	
4 48 15 11	5 9 15 11	5 13 12 6	5 35 12 6		5 35 13 2	6 38 12 11	7 18 12 6	7 18 12 6		8 35 11 3	9 13 10 7	10 8 9 11	10 8 9 11	30'3	
5 29 15 9	5 50 15 6	5 56 12 5	6 17 12 3		6 17 13 1	7 18 12 6	8 35 11 3	8 35 11 3		9 13 10 7	10 8 9 11	11 17 9 5	11 17 9 5	31'3	
6 11 15 2	6 31 14 9	6 38 12 0	6 58 11 9		6 58 12 9	7 18 12 6	8 35 11 3	8 35 11 3		9 13 10 7	10 8 9 11	11 17 9 5	11 17 9 5	32'3	
6 52 14 3	7 13 13 9	7 18 11 5	7 37 11 1		7 37 12 3	8 35 11 3	9 13 10 7	9 13 10 7		10 8 9 11	11 17 9 5	12 1 10 1	12 1 10 1	33'3	
7 35 13 2	7 58 12 6	7 57 10 8	8 16 10 3		8 16 11 8	9 13 10 7	10 8 9 11	10 8 9 11		11 17 9 5	12 1 10 1	1 3 11 5	1 3 11 5	34'3	
8 21 11 11	8 46 11 3	8 36 9 11	8 58 9 7		8 53 10 11	9 13 10 7	10 8 9 11	10 8 9 11		11 17 9 5	12 1 10 1	1 3 11 5	1 3 11 5	35'3	
9 14 10 10	9 45 10 5	9 22 9 3	9 49 9 0		9 38 10 3	10 8 9 11	11 17 9 5	11 17 9 5		12 1 10 1	1 3 11 5	2 3 10 1	2 3 10 1	36'3	
10 19 10 2	10 58 10 1	10 19 8 9	10 56 8 8		10 41 9 7	11 17 9 5	12 1 10 1	12 1 10 1		1 3 11 5	2 3 10 1	3 3 9 1	3 3 9 1	37'3	
11 37 10 2	— —	11 34 8 8	— —		11 51 9 4	— —	— —	— —		2 3 10 1	3 3 9 1	4 3 8 1	4 3 8 1	38'3	
0 14 10 4	0 47 10 7	0 11 8 9	0 47 8 11		0 25 9 6	0 58 9 8	1 3 10 1	1 3 10 1		3 3 9 1	4 3 8 1	5 3 7 1	5 3 7 1	39'3	
1 19 11 0	1 46 11 5	1 22 9 1	1 55 9 4		1 31 9 10	2 3 10 1	3 3 9 1	3 3 9 1		4 3 8 1	5 3 7 1	6 3 6 1	6 3 6 1	40'3	
2 8 11 9	2 29 12 2	2 21 9 7	2 45 9 11		2 31 10 5	3 3 9 1	4 3 8 1	4 3 8 1		5 3 7 1	6 3 6 1	7 3 5 1	7 3 5 1	41'3	
2 49 12 8	3 8 13 0	3 7 10 3	3 26 10 6		3 22 11 0	4 3 8 1	5 3 7 1	5 3 7 1		6 3 6 1	7 3 5 1	8 3 4 1	8 3 4 1	42'3	
3 25 13 4	3 41 13 8	3 45 10 9	4 3 11 0		4 4 11 6	5 3 7 1	6 3 6 1	6 3 6 1		7 3 5 1	8 3 4 1	9 3 3 1	9 3 3 1	43'3	
3 59 13 11	4 17 14 2	4 22 11 3	4 40 11 4		4 43 11 11	5 3 7 1	6 3 6 1	6 3 6 1		7 3 5 1	8 3 4 1	9 3 3 1	9 3 3 1	44'3	
4 34 14 5	4 52 14 7	4 59 11 6	5 18 11 8		5 21 12 2	6 3 6 1	7 3 5 1	7 3 5 1		8 3 4 1	9 3 3 1	10 3 2 1	10 3 2 1	45'3	
5 10 14 8	5 28 14 8	5 37 11 8	5 55 11 8		5 57 12 4	6 3 6 1	7 3 5 1	7 3 5 1		8 3 4 1	9 3 3 1	10 3 2 1	10 3 2 1	46'3	
5 47 14 7	6 6 14 5	6 14 11 8	6 33 11 7		6 35 12 4	7 3 5 1	8 3 4 1	8 3 4 1		9 3 3 1	10 3 2 1	11 3 1 1	11 3 1 1	47'3	
6 26 14 3	6 47 14 0	6 52 11 5	7 12 11 3		7 13 12 2	8 3 4 1	9 3 3 1	9 3 3 1		10 3 2 1	11 3 1 1	12 3 0 1	12 3 0 1	48'3	
7 9 13 9	7 33 13 5	7 33 11 1	7 55 10 10		7 53 12 0	8 3 4 1	9 3 3 1	9 3 3 1		11 3 1 1	12 3 0 1	1 3 11 5	1 3 11 5	49'3	
8 0 13 0	8 28 12 6	8 18 10 7	8 42 10 4		8 36 11 7	9 3 3 1	10 3 2 1	10 3 2 1		12 3 0 1	1 3 11 5	2 3 10 1	2 3 10 1	50'3	
8 58 12 1	9 30 11 9	9 9 10 1	9 37 9 10		9 23 11 1	10 3 2 1	11 3 1 1	11 3 1 1		1 3 11 5	2 3 10 1	3 3 9 1	3 3 9 1	51'3	
10 8 11 7	10 48 11 7	10 10 9 8	10 47 9 8		10 31 10 7	11 3 1 1	12 3 0 1	12 3 0 1		2 3 10 1	3 3 9 1	4 3 8 1	4 3 8 1	52'3	
11 28 11 9	— —	11 25 9 8	— —		11 44 10 5	— —	— —	— —		3 3 9 1	4 3 8 1	5 3 7 1	5 3 7 1	53'3	
If Mean Spring } 7ft. 5in. Range.					5ft. 10in.					6ft. 2in.					

Equation of Time at Noon.

M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
3 49		9	1 30		17	0 33		25	2 12	
3 31		10	1 14		18	0 47		26	2 22	
3 13		11	0 57		19	1 0		27	2 31	
2 56		12	0 42		20	1 13		28	2 41	
2 38		13	0 26		21	1 26		29	2 49	
2 21		14	0 11		22	1 38		30	2 57	
2 4		15	0 4	Add.	23	1 50				
1 47		16	0 19		24	2 1				

as of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 8 m.

TIDE TABLES FOR THE

MAY, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.																	
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.															
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.														
M.	1	8 mo	11 42	15 7	—	—	0 35	13 4	1 17	13 0	6 52	10 11	7 29															
Tu.	2	8 51	0 15	16 1	0 45	16 8	1 55	13 11	2 32	13 10	8 4	11 4	8 36															
W.	3	9 43	1 15	17 3	1 40	17 10	3 3	14 9	3 30	14 8	9 7	12 0	9 34															
Th.	4	10 35	2 5	18 5	2 30	18 11	3 57	15 3	4 23	15 3	10 0	12 5	10 26															
F.	5	11 28	2 53	19 3	3 15	19 6	4 48	15 7	5 12	15 8	10 49	12 9	11 11															
S.	6	0 23	3 36	19 6	3 58	19 5	5 33	15 9	5 54	15 9	11 32	12 10	11 54															
M.	7	1 17	4 20	19 3	4 40	19 0	6 15	15 8	6 36	15 8	—	—	0 17															
Tu.	8	2 10	4 59	18 8	5 19	18 3	6 54	15 4	7 12	15 5	0 39	12 7	0 59															
W.	9	3 2	5 37	17 10	5 57	17 5	7 30	14 9	7 47	14 10	1 19	12 3	1 39															
Th.	10	3 52	6 18	16 11	6 39	16 3	8 5	14 0	8 23	14 2	1 58	11 10	2 20															
F.	11	4 39	6 59	15 8	7 22	15 1	8 40	13 2	8 58	13 5	2 40	11 4	3 0															
S.	12	5 24	7 45	14 6	8 9	14 1	9 18	12 5	9 40	12 8	3 21	10 10	3 43															
M.	13	6 8	8 36	13 8	9 4	13 5	10 3	11 9	10 30	12 1	4 6	10 5	4 33															
Tu.	14	6 50	9 37	13 4	10 11	13 4	10 57	11 4	11 32	11 11	5 0	10 0	5 30															
W.	15	7 32	10 46	13 6	11 18	13 9	—	—	0 9	11 6	6 3	9 10	6 35															
Th.	16	8 15	11 50	14 1	—	—	0 45	12 2	1 20	12 1	7 7	10 0	7 58															
F.	17	8 59	0 20	14 6	0 46	14 11	1 54	12 10	2 26	12 10	8 8	10 6	8 57															
S.	18	9 45	1 12	15 5	1 35	16 0	2 53	13 6	3 20	13 7	9 3	11 0	9 27															
M.	19	10 34	1 56	16 6	2 16	17 0	3 43	14 0	4 6	14 3	9 50	11 7	10 11															
Tu.	20	11 27	2 35	17 6	2 55	18 0	4 29	14 6	4 51	14 9	10 31	12 0	10 51															
W.	21	morn.	3 16	18 4	3 37	18 7	5 11	14 11	5 31	15 3	11 12	12 3	11 53															
Th.	22	0 22	3 59	18 9	4 20	18 10	5 52	15 3	6 13	15 7	11 55	12 6	—															
F.	23	1 19	4 39	18 11	4 59	18 10	6 34	15 4	6 54	15 8	0 16	12 6	0 38															
S.	24	2 17	5 21	18 8	5 43	18 7	7 14	15 8	7 34	15 7	0 59	12 6	1 21															
M.	25	3 15	6 6	18 4	6 31	18 0	7 56	14 10	8 19	15 3	1 44	12 4	2 7															
Tu.	26	4 11	6 56	17 6	7 24	17 0	8 42	14 5	9 7	14 9	2 32	12 2	2 58															
W.	27	5 5	7 54	16 6	8 24	16 0	9 34	13 10	10 1	14 1	3 24	11 9	3 52															
Th.	28	5 57	8 55	15 8	9 26	15 5	10 29	13 2	11 1	13 7	4 21	11 4	4 51															
F.	29	6 48	10 1	15 5	10 37	15 6	11 33	12 10	—	—	5 21	11 0	5 54															
S.	30	7 38	11 12	15 7	11 45	15 10	0 11	13 5	0 51	13 1	6 27	10 10	7 0															
M.	31	8 20	—	—	0 16	16 1	1 28	13 9	2 3	13 7	7 33	11 1	8 6															
Half Mean Spring Range.			9 ^{ft.} 6 ^{in.}				7 ^{ft.} 9 ^{in.}				6 ^{ft.} 4 ^{in.}																	
Phases of the Moon.													Moon's Declination at Noon.															
D. H. M.													M.D. ° ' "				M.D. ° ' "				M.D. ° ' "				M.D. ° ' "			
New - - - - - 6 0 14 Morning.													1 28. 33				9 19 N. 50				17 6 S. 23				25			
First Quarter - 13 6 21 Afternoon.													2 2 N. 24				10 18 24				18 10 21				26			
Full - - - - - 21 1 24 Afternoon.													3 7 13				11 16 8				19 13 57				27			
Last Quarter - 28 9 21 Morning.													4 11 35				12 13 13				20 16 57				28			
													5 15 16				13 9 48				21 19 7				29			
In Perigee - - 1 11 0 Morning.													6 1 1				14 6 0				22 20 13				30			
In Apogee - - 13 9 0 Afternoon.													7 19 43				15 1 57				23 20 7				31			
In Perigee - - 26 0 0 Noon.													8 20 19				16 2 S. 14				24 18 44							

MAY, 1864.

DOVER.						SHEERNESS.						LONDON.						C's AGE AT NOON.	
MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.				
me.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.			
M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	H.	M.	F.	L.	D
19	15	7	6	55	16	0	8	5	13	9	8	44	14	0	9	31	16	7	10 9 16 9 24.9
30	16	6	8	1	17	0	9	20	14	4	9	52	14	9	10	46	17	0	11 20 17 3 25.9
30	17	5	8	57	17	10	10	21	15	1	10	49	15	5	11	50	17	7	— — 26.9
23	18	2	9	50	18	6	11	14	15	8	11	38	15	11	0	18	17	11	0 44 18 3 27.9
16	18	9	10	40	18	11	—	—	—	—	0	3	16	2	1	9	18	7	1 34 18 10 28.9
3	18	11	11	27	18	11	0	26	16	3	0	48	16	4	1	58	19	1	2 18 19 3 ●
50	18	10	—	—	—	—	1	9	16	5	1	30	16	4	2	40	19	4	3 0 19 4 1.5
13	18	8	0	34	18	5	1	51	16	2	2	11	16	0	3	22	19	3	3 40 19 2 2.5
56	18	2	1	17	17	10	2	30	15	10	2	49	15	8	4	0	19	0	4 20 18 9 3.5
38	17	6	2	0	17	2	3	8	15	4	3	27	15	1	4	39	18	6	4 59 18 2 4.5
21	16	9	2	42	16	3	3	48	14	9	4	9	14	5	5	20	17	11	5 38 17 6 5.5
3	15	10	3	24	15	5	4	30	14	1	4	53	13	9	5	59	17	2	6 22 16 10 6.5
47	15	1	4	12	14	8	5	17	13	5	5	43	13	3	6	45	16	6	7 10 16 3 7.5
37	14	4	5	5	14	2	6	12	13	0	6	43	12	10	7	37	16	0	8 7 15 10 8.5
34	14	1	6	3	14	2	7	17	12	10	7	53	12	11	8	43	15	8	9 18 15 8 9.5
33	14	5	7	3	14	9	8	27	13	0	8	58	13	3	9	51	15	8	10 22 15 10 10.5
34	15	2	8	2	15	6	9	28	13	6	9	57	13	9	10	56	16	0	11 26 16 3 11.5
27	15	11	8	50	16	4	10	22	14	1	10	46	14	4	11	54	16	6	— — 12.5
13	16	9	9	35	17	11	11	9	14	8	11	29	14	11	0	17	16	9	0 38 17 1 13.5
56	17	5	10	19	17	9	11	49	15	2	—	—	—	0	59	17	5	1	20 17 9 14.5
41	18	0	11	4	18	3	0	8	15	4	0	28	15	7	1	41	18	0	2 2 18 4 ○
28	18	4	11	50	18	6	0	49	15	9	1	10	15	11	2	20	18	7	2 40 18 9 16.5
—	—	—	0	12	18	7	1	31	16	0	1	51	16	0	2	58	18	11	3 19 19 0 17.5
34	18	7	0	58	18	6	2	10	16	0	2	30	15	11	3	39	19	1	4 0 19 1 18.5
23	18	5	1	47	18	3	2	51	15	10	3	13	15	9	4	22	19	0	4 45 18 11 19.5
12	18	0	2	38	17	8	3	36	15	7	4	1	15	4	5	6	18	9	5 31 18 6 20.5
5	17	4	3	33	17	0	4	27	15	1	4	54	14	9	5	57	18	3	6 24 18 0 21.5
2	16	8	4	30	16	3	5	24	14	6	5	57	14	4	6	54	17	9	7 26 17 5 22.5
57	15	11	5	26	15	10	6	31	14	1	7	5	13	11	7	59	17	3	8 32 17 1 23.5
56	15	9	6	26	15	11	7	42	14	0	8	19	14	1	9	7	17	0	9 43 16 11 24.5
58	16	2	7	31	16	6	8	51	14	3	9	23	14	6	10	18	17	0	10 49 17 1 25.5
mean Spring } 9ft. 4in. range.						8ft. 0in.						9ft. 7in.							

Equation of Time at Noon.

M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
3 5		9	3 45		17	3 49		25	3 19	
3 12		10	3 48		18	3 47		26	3 13	
3 18		11	3 49		19	3 45		27	3 6	
3 24		12	3 51		20	3 42		28	2 59	
3 30		13	3 52		21	3 38		29	2 51	
3 34		14	3 52		22	3 34		30	2 43	
3 38		15	3 52		23	3 30		31	2 34	
3 42		16	3 51		24	3 24				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

MAY, 1864.

Week Day.	Month Day.	Moon's Transit.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.
M.	1	8m 0	7 13	10 2	7 52	10 4	1 42	17 4	2 17	17 8	11 10	11 11	11 42	12
Tu.	2	8 51	8 27	10 6	8 59	10 9	2 49	18 2	3 20	18 10	—	—	0 11	12
W.	3	9 43	9 28	11 0	9 57	11 3	3 49	19 4	4 18	19 10	0 39	13 0	1 8	13
Th.	4	10 35	10 25	11 5	10 50	11 7	4 43	20 3	5 6	20 8	1 35	13 9	2 1	14
F.	5	11 28	11 15	11 9	11 39	11 10	5 31	20 11	5 55	21 2	2 27	14 3	2 51	14
S.	6	0 23	—	—	0 11	10	6 18	21 2	6 40	21 3	3 12	14 6	3 38	14
M.	7	1 17	0 22	11 10	0 43	11 9	7 21	21 2	7 24	21 0	3 53	14 7	4 14	14
Tu.	8	2 10	1 5	11 8	1 26	11 6	7 45	20 10	8 3	20 7	4 34	14 5	4 53	14
W.	9	3 2	1 45	11 4	2 5	11 2	8 23	20 3	8 43	19 9	5 13	13 10	5 33	13
Th.	10	3 52	2 25	10 11	2 45	10 9	9 2	19 4	9 25	18 10	5 53	13 1	6 15	13
F.	11	4 39	3 7	10 7	3 27	10 4	9 45	18 3	10 5	17 10	6 38	12 4	7 1	13
S.	12	5 24	3 47	10 2	4 8	10 0	10 29	17 4	10 55	16 11	7 25	11 9	7 40	11
M.	13	6 8	4 30	9 10	4 55	9 8	11 24	16 7	11 56	16 3	8 15	11 2	8 44	11
Tu.	14	6 50	5 22	9 7	5 50	9 6	—	—	0 28	16 0	9 14	10 10	9 48	—
W.	15	7 32	6 23	9 6	7 0	9 7	1 0	15 11	1 31	15 11	10 22	10 9	10 55	10
Th.	16	8 15	7 35	9 8	8 6	9 10	2 1	16 1	2 29	16 5	11 23	11 0	11 50	11
F.	17	8 59	8 35	9 11	9 3	10 2	2 57	16 11	3 25	17 5	—	—	0 16	11
S.	18	9 45	9 29	10 4	9 55	10 6	3 51	17 10	4 15	18 3	0 41	11 11	1 5	12
M.	19	10 34	10 19	10 9	10 40	10 11	4 38	18 9	4 57	19 1	1 28	12 7	1 51	12
Tu.	20	11 27	11 0	11 1	11 21	11 3	5 17	19 5	5 36	19 9	2 12	13 1	2 33	13
W.	21	morn.	11 41	11 4	—	—	5 57	20 0	6 19	20 3	2 53	13 7	3 15	13
Th.	22	0 22	0 2	11 5	0 23	11 6	6 41	20 5	7 3	20 7	3 33	14 0	3 54	14
F.	23	1 19	0 44	11 6	1 4	11 6	7 23	20 8	7 44	20 8	4 14	14 3	4 33	14
S.	24	2 17	1 24	11 5	1 44	11 4	8 3	20 8	8 25	20 7	4 53	14 3	5 15	14
M.	25	3 15	2 7	11 3	2 31	11 2	8 48	20 5	9 12	20 1	5 39	13 11	6 3	13
Tu.	26	4 11	2 55	11 1	3 19	11 0	9 37	19 9	10 2	19 4	6 29	13 5	6 57	13
W.	27	5 5	3 44	10 10	4 10	10 8	10 30	19 0	11 2	18 7	7 26	12 11	7 56	12
Th.	28	5 57	4 38	10 6	5 10	10 5	11 38	18 3	—	—	8 29	12 5	9 2	12
F.	29	6 48	5 41	10 4	6 13	10 4	0 16	18 0	0 50	17 9	9 36	12 1	10 13	12
S.	30	7 38	6 49	10 4	7 27	10 5	1 23	17 9	1 54	17 10	10 46	12 1	11 16	12
M.	31	8 29	7 59	10 6	8 30	10 7	2 23	18 1	2 52	18 5	11 45	12 5	—	—
Half Mean Spring Range.			5ft. 9in.				10ft. 5in.				7ft. 2in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M. D.	°	'	M. D.	°	'	M. D.	°
New	-	-	6	0	14	Morning.	1	28.	33	9	19	N. 50	17	6S. 23
First Quarter	-	13	6	21	Afternoon.		2	2	N. 24	10	18	24	18	10 21
Full	-	-	21	1	24	Afternoon.	3	7	13	11	16	8	19	13 57
Last Quarter	-	28	9	21	Morning.		4	11	35	12	13	13	20	16 57
							5	15	16	13	9	48	21	19 7
In Perigee	-	1	11	0	Morning.		6	18	1	14	6	0	22	20 13
In Apogee	-	13	9	0	Afternoon.		7	19	43	15	1	57	23	20 7
In Perigee	-	26	0	0	Noon.		8	20	19	16	28.	14	24	18 44

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

MAY, 1864.

NORTH SHIELDS.					LEITH.					THURSO.					C's AGE AT NOON.
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			
Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.	
11 22 10 11		11 56 11 3			10 16 13 7		10 49 13 11			4 15 10 5		4 50 10 7		24.9	
— — — —		0 25 11 7			11 18 14 3		11 46 14 8			5 20 10 11		5 47 11 4		25.9	
0 52 11 11		1 18 12 2			— — — —		0 12 15 0			6 13 11 9		6 35 12 3		26.9	
1 42 12 6		2 6 12 10			0 36 15 5		1 1 15 10			6 57 12 8		7 18 13 1		27.9	
2 30 13 1		2 51 13 3			1 26 16 2		1 49 16 5			7 38 13 5		7 59 13 7		28.9	
3 12 13 5		3 33 13 6			2 10 16 7		2 31 16 8			8 19 13 8		8 39 13 6		●	
3 54 13 5		4 15 13 4			2 51 16 7		3 11 16 5			9 0 13 4		9 21 13 2		1.5	
4 36 13 2		4 56 12 10			3 31 16 2		3 50 15 10			9 40 12 10		10 1 12 6		2.5	
5 17 12 6		5 37 12 3			4 11 15 6		4 32 15 3		10 22 12 2		10 43 11 9		3.5		
5 57 12 0		6 19 11 8			4 52 14 11		5 14 14 7		11 6 11 5		11 28 11 0		4.5		
6 41 11 4		7 2 11 0			5 36 14 2		5 59 13 9		11 51 10 7		— — — —		5.5		
7 27 10 8		7 53 10 3			6 23 13 5		6 48 13 0		0 16 10 3		0 41 9 11		6.5		
8 21 9 11		8 52 9 9			7 16 12 9		7 47 12 6		1 7 9 8		1 37 9 5		7.5		
9 25 9 8		10 1 9 7			8 18 12 4		8 53 12 3		2 9 9 3		2 45 9 2		8.5		
10 34 9 8		11 5 9 10			9 28 12 4		10 0 12 5		3 23 9 2		3 58 9 3		9.5		
11 36 10 1		— — — —			10 29 12 7		10 56 12 10		4 29 9 5		4 58 9 7		10.5		
0 3 10 4		0 30 10 7			11 23 13 2		11 48 13 5		5 25 9 9		5 50 10 1		11.5		
0 54 10 10		1 16 11 1			— — — —		0 10 13 9		6 12 10 6		6 32 10 11		12.5		
1 37 11 4		1 57 11 7			0 31 14 2		0 51 14 6		6 50 11 4		7 7 11 9		13.5		
2 16 11 11		2 35 12 3			1 11 14 11		1 31 15 3		7 23 12 2		7 41 12 6		14.5		
2 54 12 6		3 13 12 9			1 51 15 7		2 11 15 10		8 0 12 10		8 20 13 0		○		
3 34 12 11		3 55 13 0			2 32 16 0		2 52 16 1		8 40 13 1		9 0 13 1		16.5		
4 15 13 1		4 35 13 1			3 11 16 2		3 31 16 1		9 20 13 1		9 40 13 0		17.5		
4 56 12 11		5 19 12 9			3 51 16 0		4 13 15 10		10 3 12 10		10 27 12 8		18.5		
5 43 12 8		6 7 12 6			4 37 15 8		5 1 15 6		10 52 12 5		11 19 12 1		19.5		
6 32 12 4		6 59 12 1			5 27 15 4		5 55 15 0		11 47 11 10		— — — —		20.5		
7 28 11 10		8 0 11 6			6 25 14 8		6 55 14 4		0 16 11 6		0 47 11 3		21.5		
8 35 11 2		9 11 11 0			7 30 14 1		8 5 13 10		1 21 11 0		1 56 10 9		22.5		
9 47 10 11		10 25 11 0			8 41 13 9		9 18 13 8		2 31 10 8		3 12 10 7		23.5		
10 58 11 1		11 29 11 3			9 53 13 9		10 23 13 11		3 50 10 7		4 22 10 8		24.5		
11 59 11 5		— — — —			10 52 14 1		11 20 14 3		4 53 10 9		5 22 10 11		25.5		
Mean Spring } 6ft. 8in.					8ft. 2in.					6ft. 7in.					
Range.															

Equation of Time at Noon.

M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
3 5		9	3 45		17	3 49		25	3 19	
3 12		10	3 48		18	3 47		26	3 13	
3 18		11	3 49		19	3 45		27	3 6	
3 24		12	3 51		20	3 42		28	2 59	
3 30		13	3 52		21	3 38		29	2 51	
3 34		14	3 52		22	3 34		30	2 43	
3 38		15	3 52		23	3 30		31	2 34	
3 42		16	3 51		24	3 24				

es of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

JUNE, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.						
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.				
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.			
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.			
W.	1	9m20	0 48	16 5	1 20	16 9	2 35	14 1	3 7	14 2	8 40	11 6	9 12				
Th.	2	10 13	1 47	17 2	2 11	17 7	3 35	14 5	4 3	14 7	9 41	11 11	10 6				
F.	3	11 6	2 34	17 11	2 59	18 2	4 27	14 10	4 51	15 0	10 30	12 2	10 55				
S.	4	12 0	3 22	18 3	3 43	18 3	5 15	15 0	5 36	15 4	11 18	12 3	11 38				
S.	5	0a52	4 4	18 2	4 25	18 1	5 57	15 0	6 17	15 5	12 0	12 3	—				
M.	6	1 43	4 43	18 0	5 1	17 9	6 37	14 11	6 55	15 3	0 21	12 2	0 41				
Tu.	7	2 32	5 20	17 6	5 38	17 3	7 12	14 6	7 28	14 11	1 1	11 11	1 20				
W.	8	3 18	5 57	17 0	6 15	16 9	7 44	14 1	8 1	14 5	1 39	11 9	1 57				
Th.	9	4 3	6 34	16 4	6 53	16 0	8 18	13 5	8 34	13 9	2 15	11 6	2 35				
F.	10	4 45	7 15	15 6	7 38	15 1	8 50	12 10	9 8	13 1	2 55	11 2	3 16				
S.	11	5 27	7 59	14 8	8 21	14 4	9 28	12 3	9 48	12 6	3 37	10 10	3 57				
S.	12	6 9	8 44	14 1	9 10	13 10	10 12	11 10	10 36	12 1	4 18	10 6	4 41				
M.	13	6 52	9 40	13 9	10 11	13 10	11 4	11 7	11 35	12 0	5 6	10 2	5 33				
Tu.	14	7 37	10 44	13 10	11 18	14 0	—	—	0 10	11 11	6 3	10 0	6 33				
W.	15	8 24	11 52	14 4	—	—	0 46	12 3	1 22	12 4	7 6	10 2	7 39				
Th.	16	9 14	0 23	14 9	0 51	15 2	1 57	12 8	2 32	13 0	8 12	10 7	8 42				
F.	17	10 8	1 18	15 8	1 43	16 3	3 1	13 4	3 30	13 9	9 10	11 2	9 36				
S.	18	11 5	2 7	16 11	2 31	17 6	3 57	14 0	4 22	14 7	10 2	11 9	10 27				
S.	19	morn.	2 54	18 1	3 17	18 6	4 47	14 8	5 11	15 3	10 50	12 2	11 13				
M.	20	0 4	3 40	18 10	4 3	19 1	5 34	15 2	5 57	16 2	11 36	12 6	11 59				
Tu.	21	1 3	4 26	19 3	4 49	19 7	6 20	15 8	6 44	16 2	—	—	0 23				
W.	22	2 2	5 11	19 5	5 33	19 4	7 6	15 7	7 28	16 2	0 48	12 9	1 11				
Th.	23	2 58	5 57	19 3	6 21	19 0	7 51	15 5	8 15	15 11	1 35	12 9	1 59				
F.	24	3 52	6 47	18 7	7 13	18 1	8 39	15 0	9 1	15 5	2 23	12 8	2 49				
S.	25	4 45	7 40	17 7	8 7	16 11	9 23	14 5	9 47	14 8	3 14	12 3	3 40				
S.	26	5 36	8 34	16 4	9 2	15 10	10 13	13 9	10 39	13 10	4 5	11 10	4 31				
M.	27	6 26	9 31	15 6	10 3	15 3	11 7	13 3	11 37	13 3	4 58	11 3	5 25				
Tu.	28	7 17	10 38	14 11	11 14	15 0	—	—	0 11	12 11	5 56	10 9	6 28				
W.	29	8 9	11 53	15 1	—	—	0 48	13 0	1 26	13 0	7 3	10 8	7 40				
Th.	30	9 1	0 26	15 3	0 59	15 7	2 4	13 1	2 39	13 4	8 15	10 11	8 50				
Half Mean Spring Range.			9ft. 6in.				7ft. 9in.				6ft. 4in.						
Phases of the Moon.						Moon's Declination at Noon.											
D. H. M.						M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
New	—	—	4 11 40	Morning.	1	14 N. 13	9	11 N. 3	17	18 S. 22	25						
First Quarter	—	—	12 11 48	Morning.	2	17 14	10	7 22	18	19 56	26						
Full	—	—	19 10 54	Afternoon.	3	19 16	11	3 24	19	20 19	27						
Last Quarter	—	—	26 2 15	Afternoon.	4	20 15	12	08.43	20	19 24	28						
						5	9	13	4 51	21	17 13	29					
In Apogee	—	—	10 3 0	Afternoon.	6	19 3	14	8 52	22	13 54	30						
In Perigee	—	—	22 1 0	Afternoon.	7	17 3	15	12 35	23	9 44							
						8	14 20	16	15 50	24	5 1						

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 Brest add 18 m. Devonport add 17 m. Portsmouth add 4

MAY, 1864.

TON-SUPER-MARK.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.					
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.							
Height. F. L.		Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.		D.				
0	11	2 16	31	6 5	50	13	8	6 23	14	0 6	37	9	5	7 10	9	8	24.9
2	4	3 26	33	3 6	52	14	4	7 20	14	8 7	40	9	11	8 10	10	1	25.9
4	2	4 33	35	1 7	47	15	1	8 12	15	5 8	40	10	4	9 8	10	6	26.9
5	0	5 31	36	8 8	36	15	8	8 59	15	11 9	34	10	8	9 59	10	10	27.9
7	3	6 23	37	6 9	22	16	1	9 43	16	3 10	20	11	0	10 41	11	1	28.9
7	7	7 8	37	7 10	4	16	3	10 24	16	2 11	1	11	2	11 22	11	1	●
7	6	7 50	37	2 10	43	16	1	11 2	15	11 11	43	11	0	—	—	1	5
6	9	8 28	36	2 11	21	15	9	11 42	15	5 0	4	10	10	0 24	10	9	2.5
5	7	9 5	34	11 —	—	—	—	0 3	15	1 0	45	10	7	1 6	10	8	3.5
4	1	9 41	33	2 0	24	14	9	0 47	14	5 1	26	10	1	1 48	9	11	4.5
2	2	10 15	31	5 1	10	14	0	1 32	13	8 2	10	9	8	2 32	9	6	5.5
10	6	10 54	29	9 1	56	13	4	2 21	13	0 2	56	9	4	3 20	9	2	6.5
19	0	11 45	28	6 2	48	12	9	3 18	12	6 3	46	9	0	4 17	8	10	7
—	—	0 16	28	1 3	50	12	4	4 26	12	3 4	48	8	9	5 20	8	8	8.5
28	0	1 21	28	2 5	1	12	4	5 33	12	6 5	52	8	8	6 21	8	9	9.5
28	6	2 25	29	0 6	3	12	9	6 30	12	11 6	50	8	11	7 18	9	1	10.5
29	8	3 27	30	5 6	57	13	2	7 22	13	6 7	45	9	3	8 11	9	6	11.5
31	2	4 24	32	1 7	45	13	10	8 7	14	2 8	37	9	8	9 1	9	10	12.5
32	11	5 15	33	9 8	27	14	5	8 46	14	9 9	24	10	0	9 45	10	2	13.5
33	6	6 1	35	2 9	5	15	0	9 24	15	3 10	4	10	4	10 23	10	6	14.5
43	8	6 46	36	2 9	44	15	6	10 5	15	8 10	42	10	8	11 2	10	9	○
8	36	7 7	29	36	11 10	25	15	9 10	43	15	10 11	23	10	10 11	43	10	16.5
9	37	0 8	9	37	0 11	1	15	10 11	20	15	9 —	—	—	0 4	10	10	17.5
10	36	10 8	51	36	8 11	44	15	8 —	—	—	0 24	10	9	0 47	10	8	18.5
13	36	4 9	35	35	10 0	9	15	7 0	34	15	4 1	11	10	7 1	36	10	19.5
57	35	2 10	19	34	5 1	1	15	1 1	29	14	10 2	1	10	4 2	29	10	20.5
42	33	8 11	9	32	11 1	58	14	7 2	28	14	3 2	57	10	0 3	27	9	21.5
37	32	2 —	—	—	3 2	14	0	3 37	13	10 4	0	9	9	4 36	9	7	○
6	31	8 0	39	31	5 4	12	13	9 4	51	13	9 5	10	9	6 5	43	9	23.5
13	31	5 1	46	31	7 5	26	13	10 5	56	14	0 6	14	9	6 6	44	9	24.5
20	31	10 2	54	32	4 6	26	14	2 6	54	14	4 7	13	9	9 7	42	9	25.5
Spring } 18 ^{ft.} 7 ^{in.}				8 ^{ft.} 0 ^{in.}				5 ^{ft.} 6 ^{in.}									

Equation of Time at Noon.

h.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
5		9	3 45		17	3 49		25	3 19	
12		10	3 48		18	3 47		26	3 13	
18		11	3 49		19	3 45		27	3 6	
24		12	3 51		20	3 42		28	2 59	
30		13	3 52		21	3 38		29	2 51	
34		14	3 52		22	3 34		30	2 43	
38		15	3 52		23	3 30		31	2 34	
42		16	3 51		24	3 24				

High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 IF R-MARK add 12 m. } HOLYHEAD add 18 m. } KINGSTOWN subtract 1 m. for Dublin Time.

MAY, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRAMIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	8m 0	6 20	8 4	6 55	8 5	3 54	6 6	4 23	6 9	0 54	9 1	1 28	
M.	2	8 51	7 26	8 7	7 54	8 9	4 47	6 11	5 9	7 1	1 59	9 7	2 26	
Tu.	3	9 43	8 21	8 11	8 46	9 2	5 32	7 3	5 56	7 5	2 52	10 2	3 15	
W.	4	10 35	9 10	9 4	9 35	9 5	6 20	7 7	6 45	7 8	3 38	10 9	4 1	
Th.	5	11 28	9 58	9 6	10 19	9 7	7 10	7 9	7 33	7 10	4 24	11 3	4 46	
F.	6	0 23	10 40	9 7	11 1	9 7	7 54	7 10	8 14	7 10	5 8	11 5	5 30	
S.	7	1 17	11 21	9 6	11 40	9 5	8 34	7 9	8 52	7 7	5 51	11 4	6 10	
S.	8	2 10	11 59	9 4	—	—	9 10	7 5	9 29	7 3	6 29	10 11	6 50	
M.	9	3 2	0 20	9 3	0 42	9 2	9 48	7 0	10 6	6 10	7 10	10 4	7 30	
Tu.	10	3 52	1 3	9 0	1 27	8 11	10 27	6 7	10 48	6 4	7 51	9 8	8 11	
W.	11	4 39	1 50	8 9	2 13	8 7	11 13	6 2	11 43	5 11	8 33	9 0	8 59	
Th.	12	5 24	2 38	8 5	3 3	8 3	—	—	0 14	5 8	9 26	8 6	9 55	
F.	13	6 1	3 30	8 2	3 59	8 1	0 47	5 6	1 24	5 5	10 27	8 2	11 0	
S.	14	6 50	4 29	8 0	5 1	8 0	2 2	5 5	2 38	5 5	11 34	8 1	—	
S.	15	7 32	5 33	7 11	6 3	7 11	3 11	5 7	3 40	5 10	0 6	8 2	0 37	
M.	16	8 15	6 34	8 0	7 3	8 1	4 6	6 0	4 29	6 2	1 8	8 4	1 36	
Tu.	17	8 59	7 31	8 2	7 56	8 3	4 52	6 4	5 12	6 6	2 4	8 9	2 29	
W.	18	9 45	8 19	8 5	8 40	8 8	5 31	6 7	5 51	6 9	2 50	9 3	3 11	
Th.	19	10 34	9 1	8 10	9 21	9 0	6 11	6 11	6 31	7 1	3 30	9 10	3 48	
F.	20	11 27	9 40	9 1	10 0	9 2	6 52	7 2	7 13	7 4	4 6	10 4	4 26	
S.	21	morn.	10 20	9 3	10 41	9 4	7 34	7 5	7 55	7 6	4 47	10 10	5 9	
S.	22	0 22	11 1	9 5	11 21	9 5	8 15	7 7	8 34	7 8	5 31	11 1	5 51	
M.	23	1 19	11 39	9 4	11 59	9 4	8 51	7 7	9 10	7 6	6 9	11 1	6 29	
Tu.	24	2 17	—	—	0 23	9 4	9 31	7 5	9 53	7 3	6 52	10 10	7 16	
W.	25	3 15	0 48	9 4	1 13	9 3	10 16	7 2	10 40	7 0	7 39	10 5	8 3	
Th.	26	4 11	1 40	9 2	2 10	9 0	11 8	6 10	11 42	6 7	8 30	9 11	8 55	
F.	27	5 5	2 40	8 11	3 11	8 9	—	—	0 20	6 4	9 33	9 6	10 5	
S.	28	5 57	3 44	8 8	4 18	8 7	1 1	6 3	1 44	6 2	10 47	9 2	11 21	
S.	29	6 48	4 52	8 6	5 25	8 6	2 24	6 2	3 2	6 3	11 58	9 2	—	
M.	30	7 38	5 56	8 5	6 27	8 5	3 33	6 6	4 0	6 8	0 30	9 3	1	
Tu.	31	8 29	6 58	8 6	7 28	8 7	4 25	6 10	4 48	6 11	1 31	9 5	2	
Half Mean Spring } Range.			4 ft. 9 in.				3 ft. 10 in.				5 ft. 7 in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°
New	6	0	14	Morning.	1	28.33	9	19	N.50	17	68.23	25		
First Quarter	13	6	21	Afternoon.	2	2 N.24	10	18	24	18	10	21	26	
Full	21	1	24	Afternoon.	3	7 13	11	16	8	19	13	57	27	
Last Quarter	28	9	21	Morning.	4	11 35	12	13	13	20	16	57	28	
					5	15 16	13	9	48	21	19	7	29	
In Perigee	1	11	0	Morning.	6	18 1	14	6	0	22	20	13	30	
In Apogee	13	9	0	Afternoon.	7	19 43	15	1	57	23	20	7	31	
In Perigee	26	0	0	Noon.	8	20 19	16	2	14	24	18	44		

The times for High Water are given for Mean Time at Place; if Dublin or Railway Time be required

BELFAST subtract 3 m.

LONDONDERRY add 4 m.

SLIGO BAY add 1

MAY, 1864.

GALWAY.								QUEENSTOWN.								WATERFORD.								C's Age AT NOON.
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.							
0 6 12 0	0 40 12 4			0 4 9 9	0 40 10 0			0 18 10 6	0 51 10 9			24.9												
1 10 12 9	1 37 13 2			1 15 10 3	1 48 10 6			1 24 11 0	1 57 11 3			25.9												
2 4 13 6	2 30 13 11			2 19 10 10	2 47 11 1			2 31 11 7	3 2 11 10			26.9												
2 56 14 3	3 21 14 6			3 14 11 4	3 41 11 7			3 32 12 1	4 0 12 4			27.9												
3 44 14 9	4 6 15 0			4 7 11 9	4 29 11 10			4 28 12 6	4 52 12 6			28.9												
4 27 15 0	4 48 15 0			4 51 11 11	5 14 11 11			5 14 12 6	5 35 12 6			●												
5 10 14 11	5 31 14 9			5 37 11 10	5 58 11 9			5 57 12 6	6 18 12 5			1.5												
5 51 14 6	6 11 14 2			6 17 11 7	6 37 11 5			6 38 12 3	6 59 12 2			2.5												
6 31 13 10	6 51 13 6			6 57 11 2	7 17 10 11			7 18 12 0	7 37 11 9			3.5												
7 13 13 1	7 35 12 8			7 38 10 7	7 57 10 4			7 57 11 7	8 15 11 4			4.5												
7 57 12 3	8 21 11 9			8 15 10 1	8 35 9 10			8 34 11 1	8 52 10 10			5.5												
8 45 11 4	9 10 11 0			8 57 9 7	9 19 9 4			9 11 10 7	9 33 10 4			6.5												
9 38 10 9	10 8 10 6			9 43 9 2	10 9 9 0			10 1 10 2	10 31 9 11			7.5												
10 42 10 6	11 16 10 7			10 41 8 11	11 14 8 11			11 2 9 9	11 33 9 8			8.5												
11 49 10 8	— —			11 47 8 11	— —			— —	0 2 9 8			9.5												
0 20 10 11	0 48 11 2			0 18 9 1	0 49 9 3			0 31 9 10	0 59 10 0			10.5												
1 15 11 6	1 40 11 10			1 20 9 5	1 49 9 8			1 28 10 2	1 58 10 5			11.5												
2 3 12 2	2 25 12 7			2 16 9 11	2 40 10 2			2 27 10 8	2 54 10 11			12.5												
2 46 12 10	3 7 13 2			3 4 10 5	3 26 10 8			3 19 11 2	3 43 11 5			13.5												
3 26 13 6	3 46 13 10			3 47 10 11	4 9 11 1			4 7 11 8	4 31 11 10			14.5												
4 7 14 1	4 28 14 4			4 30 11 3	4 52 11 5			4 53 12 0	5 15 12 1			○												
4 49 14 6	5 9 14 8			5 14 11 7	5 36 11 8			5 36 12 2	5 56 12 4			16.5												
5 29 14 8	5 50 14 8			5 57 11 8	6 17 11 8			6 17 12 4	6 38 12 4			17.5												
6 13 14 6	6 37 14 4			6 39 11 7	7 2 11 6			7 1 12 4	7 24 12 4			18.5												
7 1 14 2	7 26 13 11			7 25 11 4	7 49 11 2			7 46 12 3	8 9 12 1			19.5												
7 53 13 7	8 22 13 2			8 14 11 0	8 39 10 9			8 32 11 11	8 56 11 9			20.5												
8 52 12 9	9 24 12 5			9 5 10 6	9 34 10 4			9 20 11 6	9 48 11 4			21.5												
9 57 12 2	10 31 12 0			10 2 10 2	10 30 10 0			10 20 11 1	10 52 10 10			22.5												
11 6 12 1	11 42 12 2			11 5 9 11	11 39 9 11			11 25 10 9	11 55 10 8			23.5												
— —	0 14 12 3			— —	0 12 10 0			— —	0 24 10 9			24.5												
0 43 12 6	1 12 12 9			0 44 10 2	1 18 10 3			0 54 10 10	1 26 11 0			25.5												
Mean Spring } 7ft. 5in. Range.								5ft. 10in.								6ft. 2in.								

Equation of Time at Noon.

M. S.		M. D.	M. S.		M. D.	M. S.		M. D.	M. S.	
3 5	Add.	9	3 45	Add.	17	3 49	Add.	25	3 19	Add.
3 12		10	3 48		18	3 47		26	3 13	
3 18		11	3 49		19	3 45		27	3 6	
3 24		12	3 51		20	3 42		28	2 59	
3 30		13	3 52		21	3 38		29	2 51	
3 34		14	3 52		22	3 34		30	2 43	
3 38		15	3 52		23	3 30		31	2 34	
3 42		16	3 51		24	3 24				

of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 8 m.

JUNE, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
W.	1	9m20	0 48	16 5	1 20	16 9	2 35	14 1	3 7	14 2	8 40	11 6	9 12	11	
Th.	2	10 13	1 47	17 2	2 11	17 7	3 35	14 5	4 3	14 7	9 41	11 11	10 6	12	
F.	3	11 6	2 34	17 11	2 59	18 2	4 27	14 10	4 51	15 0	10 30	12 2	10 55	12	
S.	4	12 0	3 22	18 3	3 43	18 3	5 15	15 0	5 36	15 4	11 18	12 3	11 38	12	
S.	5	0a52	4 4	18 2	4 25	18 1	5 57	15 0	6 17	15 5	12 0	12 3	—	—	
M.	6	1 43	4 43	18 0	5 1	17 9	6 37	14 11	6 55	15 3	0 21	12 2	0 41	12	
Tu.	7	2 32	5 20	17 6	5 38	17 3	7 12	14 6	7 28	14 11	1 1	11 11	1 20	11	
W.	8	3 18	5 57	17 0	6 15	16 9	7 44	14 1	8 1	14 5	1 39	11 9	1 57	11	
Th.	9	4 3	6 34	16 4	6 53	16 0	8 18	13 5	8 34	13 9	2 15	11 6	2 35	11	
F.	10	4 45	7 15	15 6	7 38	15 1	8 50	12 10	9 8	13 1	2 55	11 2	3 16	11	
S.	11	5 27	7 59	14 8	8 21	14 4	9 28	12 3	9 48	12 6	3 37	10 10	3 57	10	
S.	12	6 9	8 44	14 1	9 10	13 10	10 12	11 10	10 36	12 1	4 18	10 6	4 41	10	
M.	13	6 52	9 40	13 9	10 11	13 10	11 4	11 7	11 35	12 0	5 6	10 2	5 33	10	
Tu.	14	7 37	10 44	13 10	11 18	14 0	—	—	0 10	11 11	6 3	10 0	6 33	10	
W.	15	8 24	11 52	14 4	—	—	0 46	12 3	1 22	12 4	7 6	10 2	7 39	10	
Th.	16	9 14	0 23	14 9	0 51	15 2	1 57	12 8	2 32	13 0	8 12	10 7	8 42	10	
F.	17	10 8	1 18	15 8	1 43	16 3	3 1	13 4	3 30	13 9	9 10	11 2	9 36	11	
S.	18	11 5	2 7	16 11	2 31	17 6	3 57	14 0	4 22	14 7	10 2	11	10 27	11	
S.	19	morn.	2 54	18 1	3 17	18 6	4 47	14 8	5 11	15 3	10 50	12 2	11 13	12	
M.	20	0 4	3 40	18 10	4 3	19 1	5 34	15 2	5 57	16 2	11 36	12 6	11 59	12	
Tu.	21	1 3	4 26	19 3	4 49	19 7	6 20	15 8	6 44	16 2	—	—	0 23	12	
W.	22	2 2	5 11	19 5	5 33	19 4	7 6	15 7	7 28	16 2	0 48	12 9	1 11	12	
Th.	23	2 58	5 57	19 3	6 21	19 0	7 51	15 5	8 15	15 11	1 35	12 9	1 59	12	
F.	24	3 52	6 47	18 7	7 13	18 1	8 39	15 0	9 1	15 5	2 23	12 8	2 49	12	
S.	25	4 45	7 40	17 7	8 7	16 11	9 23	14 5	9 47	14 8	3 14	12 3	3 40	12	
S.	26	5 36	8 34	16 4	9 2	15 10	10 13	13 9	10 39	13 10	4 5	11 10	4 31	11	
M.	27	6 26	9 31	15 6	10 3	15 3	11 7	13 3	11 37	13 3	4 58	11 3	5 25	11	
Tu.	28	7 17	10 38	14 11	11 14	15 0	—	—	0 11	12 11	5 56	10 9	6 28	10	
W.	29	8 9	11 53	15 1	—	—	0 48	13 0	1 26	13 0	7 3	10 8	7 40	10	
Th.	30	9 1	0 26	15 3	0 59	15 7	2 4	13 1	2 39	13 4	8 15	10 11	8 50	10	
Half Mean Spring Range.			9ft. 6in.				7ft. 9in.				6ft. 4in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	
New - - - - -	4	11	40	Morning.	1	14	N. 13	9	11	N. 3	17	18	S. 22	25 0	
First Quarter -	12	11	48	Morning.	2	17	14	10	7	22	18	19	56	26 4	
Full - - - - -	19	10	54	Afternoon.	3	19	16	11	3	24	19	20	19	27 9	
Last Quarter -	26	2	15	Afternoon.	4	20	15	12	0	S. 43	20	19	24	28 13	
							5	20	9	13	4	51	21	17 13	29 16
In Apogee - -	10	3	0	Afternoon.	6	19	3	14	8	52	21	13	54	30 18	
In Perigee - -	22	1	0	Afternoon.	7	17	3	15	12	35	23	9	44		
							8	14	20	16	15	50	24	5 1	

Altitudes of High Water are given for Mean Time at Place; If Greenwich or Railway Time be required
 BREST add 18 m. DEVONPORT add 17 m. PORTSMOUTH add 4 m.

JUNE, 1864.

DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	D.
6 9	8 35	17 0	9 54	14 9	10 25	14 11	11 20	17 3	11 52	17 5	26.5	
7 3	9 30	17 6	10 54	15 1	11 20	15 3	—	—	0 20	17 7	27.5	
7 9	10 22	17 11	11 43	15 5	—	—	0 48	17 10	1 14	18 1	28.5	
11 11	11 9	17 11	0 7	15 7	0 32	15 8	1 38	18 3	2 1	18 5	●	
11 11	11 55	17 10	0 55	15 9	1 16	15 9	2 25	18 6	2 46	18 7	1.0	
—	0 15	17 10	1 36	15 8	1 56	15 6	3 4	18 7	3 25	18 7	2.0	
8	0 57	17 6	2 14	15 5	2 32	15 4	3 44	18 6	4 2	18 5	3.0	
4	1 37	17 2	2 50	15 2	3 8	15 0	4 21	18 3	4 38	18 1	4.0	
0	2 15	16 9	3 26	14 10	3 44	14 8	4 58	17 11	5 16	17 9	5.0	
5 6	2 57	16 2	4 4	14 5	4 24	14 2	5 36	17 7	5 54	17 3	6.0	
5 10	3 38	15 7	4 46	13 11	5 8	13 9	6 16	17 1	6 38	16 10	7.0	
5 3	4 20	15 0	5 30	13 7	5 54	13 5	6 59	16 8	7 22	16 5	8.0	
4 8	5 8	14 6	6 20	13 3	6 49	13 1	7 47	16 3	8 17	16 1	9.0	
4 6	6 2	14 5	7 20	13 1	7 52	13 1	8 49	16 0	9 21	15 11	10.0	
4 8	7 5	15 0	8 25	13 2	8 58	13 5	9 51	15 11	10 22	16 0	11.0	
5 4	8 7	15 9	9 30	13 8	10 0	13 11	10 53	16 2	11 24	16 4	12.0	
16 2	8 59	16 7	10 27	14 3	10 52	14 6	11 54	16 8	—	—	13.0	
17 0	9 51	17 5	11 16	14 10	11 40	15 1	0 20	16 11	0 45	17 3	14.0	
17 10	10 41	18 1	—	—	0 4	15 4	1 9	17 8	1 34	18 0	15.0	
18 5	11 32	18 8	0 27	15 7	0 50	15 10	1 56	18 4	2 17	18 7	16.0	
18 10	—	—	1 13	16 0	1 36	16 2	2 41	18 11	3 4	19 2	17.0	
19 0	0 46	19 0	1 59	16 3	2 20	16 3	3 28	19 4	3 50	19 5	18.0	
19 0	1 38	18 11	2 42	16 3	3 4	16 3	4 12	19 5	4 35	19 5	19.0	
3 18	10 2 29	18 7	3 27	16 1	3 51	15 11	4 57	19 4	5 23	19 2	20.0	
6 18	3 3 21	17 10	4 18	15 8	4 44	15 5	5 49	18 11	6 15	18 8	21.0	
6 17	4 4 12	16 11	5 10	15 1	5 39	14 10	6 40	18 4	7 8	18 0	22.0	
17 16	5 5 2	16 0	6 8	14 6	6 39	14 3	7 36	17 8	8 7	17 4	23.0	
29 15	8 5 58	15 6	7 10	14 0	7 44	13 11	8 37	17 1	9 13	16 11	24.0	
29 15	6 7 6	15 7	8 19	13 10	8 54	13 11	9 48	16 8	10 21	16 8	25.0	
41 15	10 8 15	16 1	9 31	14 1	10 3	14 3	10 56	16 8	11 30	16 9	26.0	
n Spring } 9ft. 4in. ge.				8ft. 0in.				9ft. 7in.				

Equation of Time at Noon.

S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
25		9	1 1		17	0 38		25	2 21	
16		10	0 49		18	0 51		26	2 34	
6		11	0 37		19	1 4		27	2 46	
56		12	0 25		20	1 17		28	2 58	
46		13	0 12		21	1 30		29	3 10	
35		14	0 0		22	1 43		30	3 22	
24		15	0 13	Sub.	23	1 56				
12		16	0 26		24	2 8				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. SHEERNESS subtract 3 m. LONDON 0 m.

JUNE, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.
W.	1	9m20	9 1 10 9	9 32 10 11	3 21 18 10	3 53 19 2	0 13 12 8	0 43 12						
Th.	2	10 13	10 3 11 1	10 31 11 2	4 23 19 5	4 49 19 8	1 13 13 1	1 42 13						
F.	3	11 6	10 56 11 3	11 20 11 4	5 13 19 11	5 36 20 1	2 7 13 5	2 32 13						
S.	4	12 0	11 45 11 5	—	6 1 20 2	6 25 20 2	2 57 13 9	3 18 13						
S.	5	0a52	0 8 11 5	0 28 11 4	6 46 20 2	7 8 20 1	3 38 13 10	3 59 13						
M.	6	1 43	0 49 11 3	1 10 11 2	7 29 20 0	7 48 19 11	4 19 13 10	4 37 13						
Tu.	7	2 32	1 29 11 1	1 47 11 0	8 6 19 9	8 24 19 6	4 55 13 7	5 14 13						
W.	8	3 18	2 6 10 10	2 25 10 9	8 43 19 4	9 2 19 0	5 33 13 1	5 52 12						
Th.	9	4 3	2 44 10 7	3 2 10 6	9 21 18 8	9 40 18 4	6 11 12 8	6 32 12						
F.	10	4 45	3 22 10 4	3 42 10 3	9 59 18 0	10 21 17 8	6 54 12 2	7 17 12						
S.	11	5 27	4 2 10 1	4 23 10 0	10 44 17 4	11 9 17 1	7 40 11 9	8 2 11						
S.	12	6 9	4 43 9 11	5 6 9 10	11 36 16 10	—	8 26 11 4	8 52 11						
M.	13	6 52	5 30 9 9	5 56 9 8	0 5 16 7	0 34 16 5	9 20 11 1	9 51 11						
Tu.	14	7 37	6 26 9 8	7 0 9 9	1 3 16 4	1 32 16 4	10 22 11 0	10 52 11						
W.	15	8 24	7 33 9 10	8 6 9 11	2 1 16 5	2 30 16 8	11 23 11 2	11 51 11						
Th.	16	9 14	8 37 10 1	9 7 10 3	2 59 17 1	3 28 17 7	—	0 19 11						
F.	17	10 8	9 34 10 5	10 1 10 8	3 56 18 1	4 21 18 6	0 46 12 1	1 12 11						
S.	18	11 5	10 27 10 10	10 52 11 0	4 45 18 11	5 8 19 4	1 37 12 9	2 3 13						
S.	19	morn.	11 16 11 2	11 40 11 4	5 32 19 9	5 56 20 1	2 28 13 4	2 52 13						
M.	20	0 4	—	0 3 11 6	6 20 20 4	6 44 20 7	3 14 13 11	3 36 14						
Tu.	21	1 3	0 26 11 7	0 49 11 8	7 7 20 11	7 31 21 1	3 58 14 5	4 21 14						
W.	22	2 2	1 12 11 8	1 35 11 7	7 54 21 2	8 15 21 3	4 43 14 8	5 5 14						
Th.	23	2 58	1 57 11 7	2 21 11 6	8 38 21 2	9 2 20 11	5 28 14 5	5 53 14						
F.	24	3 52	2 46 11 5	3 10 11 4	9 27 20 8	9 53 20 3	6 18 14 1	6 46 13						
S.	25	4 45	3 36 11 2	4 1 11 1	10 19 19 11	10 46 19 6	7 14 13 7	7 42 13						
S.	26	5 36	4 26 10 11	4 52 10 9	11 16 19 0	11 49 18 7	8 11 12 11	8 40 12						
M.	27	6 26	5 20 10 7	5 48 10 5	—	0 24 18 2	9 11 12 4	9 42 12						
Tu.	28	7 17	6 17 10 4	6 51 10 3	0 55 17 10	1 25 17 7	10 15 11 11	10 47 11						
W.	29	8 9	7 28 10 3	8 3 10 3	1 55 17 6	2 26 17 7	11 19 11 10	11 51 11						
Th.	30	9 1	8 38 10 4	9 10 10 5	2 59 17 9	3 31 18 1	—	0 22 13						

Half Mean Spring } 5ft. 9in.
Rang

10ft. 5in.

7ft. 2in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
New	4	11	40	Morning.	1	14	N. 13		9	11	N. 3		17	18	S. 22		25	0	2
First Quarter	12	11	48	Morning.	2	17	14		10	7	22		18	19	56		26	4	N. 4
Full	19	10	54	Afternoon.	3	19	16		11	3	24		19	20	19		27	9	
Last Quarter	26	2	15	Afternoon.	4	20	15		12	0	S. 43		20	19	24		28	13	
					5	20	9		13	4	51		21	17	13		29	16	
In Apogee	10	3	0	Afternoon.	6	19	3		14	8	52		22	13	54		30	18	
In Perigee	22	1	0	Afternoon.	7	17	3		15	12	35		23	9	44				
					8	14	20		16	15	50		24	5	1				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—

HARWICH subtract 5 m.

HULL add 1 m.

SUNDERLAND add 5 m.

JUNE, 1864.

MORNING.	NORTH SHIELDS.				LEITH.				THURSO.				C's Age at Noon.
	MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	
1	0 28	11 7	0 56	11 9	11 49	14 6	—	—	5 22	11 2	6 18	11 6	26.5
2	1 23	11 11	1 48	12 1	0 17	14 9	0 42	15 0	6 41	11 10	7 2	12 1	27.5
3	2 11	12 3	2 34	12 6	1 6	15 3	1 30	15 6	7 22	12 5	7 45	12 8	28.5
4	2 57	12 7	3 19	12 8	1 54	15 8	2 17	15 9	8 5	12 9	8 25	12 9	●
5	3 39	12 9	4 0	12 8	2 38	15 9	2 57	15 9	8 45	12 8	9 4	12 7	1.0
6	4 20	12 7	4 39	12 5	3 15	15 7	3 34	15 5	9 23	12 5	9 42	12 3	2.0
7	4 58	11 3	5 18	12 1	3 52	15 3	4 12	15 0	10 2	12 0	10 22	11 9	3.0
8	5 38	11 11	5 57	11 9	4 32	14 10	4 51	14 8	10 42	11 6	11 1	11 3	4.0
9	6 15	11 7	6 35	11 4	5 9	14 5	5 30	14 3	11 22	11 0	11 44	10 9	5.0
10	6 56	11 2	7 19	10 11	5 52	14 0	6 15	13 8	—	—	0 7	10 6	6.0
11	7 43	10 8	8 7	10 5	6 39	13 5	7 2	13 2	0 30	10 3	0 53	10 0	7.0
12	8 33	10 2	9 1	10 0	7 28	12 11	7 55	12 9	1 18	9 10	1 46	9 8	8.0
13	9 31	9 11	10 3	9 11	8 24	12 8	8 56	12 7	2 15	9 7	2 48	9 6	9.0
14	10 34	10 0	11 4	10 1	9 28	12 7	9 59	12 8	3 23	9 6	3 57	9 6	10.0
15	11 36	10 3	—	—	10 29	12 10	10 58	13 1	4 29	9 7	5 0	9 9	11.0
16	0 5	10 6	0 33	10 9	11 26	13 4	11 53	13 7	5 28	9 11	5 54	10 4	12.0
17	0 58	11 0	1 22	11 3	—	—	0 16	13 11	6 18	10 9	6 38	11 2	13.0
18	1 44	11 6	2 7	11 10	0 39	14 4	1 2	14 9	6 59	11 8	7 20	12 1	14.0
19	2 31	12 3	2 53	12 7	1 26	15 3	1 50	15 7	7 40	12 7	8 1	12 11	15.0
20	3 14	12 9	3 36	13 1	2 12	15 11	2 34	16 2	8 23	13 2	8 45	13 4	16.0
21	3 59	13 3	4 22	13 5	2 56	16 4	3 18	16 5	9 7	13 5	9 30	13 5	17.0
22	4 45	13 4	5 8	13 3	3 40	16 5	4 3	16 4	9 53	13 4	10 17	13 3	18.0
23	5 32	13 2	5 57	13 1	4 27	16 3	5 52	16 2	10 43	13 0	11 8	13 10	19.0
24	6 22	12 11	6 49	12 9	5 17	16 0	5 44	15 9	11 36	12 6	—	—	20.0
25	7 16	12 6	7 44	12 2	6 12	15 5	6 41	15 1	0 4	12 3	0 32	11 11	21.0
26	8 15	11 9	8 46	11 5	7 10	14 8	7 41	14 4	1 2	11 6	1 32	11 3	22.0
27	9 19	11 2	9 52	10 11	8 13	14 0	8 45	13 9	2 4	10 11	2 36	10 8	23.0
28	10 26	10 10	10 59	10 10	9 20	13 7	9 53	13 6	3 13	10 6	3 51	10 4	24.0
29	11 32	10 10	—	—	10 25	13 6	10 58	13 7	4 26	10 3	5 1	10 3	25.0
30	0 6	10 11	0 36	11 1	11 29	13 8	12 0	13 10	5 31	10 4	6 2	10 7	26.0

Half Mean Spring
Range.

6ft. 8in.

8ft. 2in.

6ft. 7in.

Equation of Time at Noon.

M.D.	M. S.		M.D.	M. S.		M.D.	M. S.		M.D.	M. S.	
1	2 25	Add.	9	1 1	Add.	17	0 38	Sub.	25	2 21	Sub.
2	2 16		10	0 49		18	0 51		26	2 34	
3	2 6		11	0 37		19	1 4		27	2 46	
4	1 56		12	0 25		20	1 17		28	2 58	
5	1 46		13	0 12		21	1 30		29	3 10	
6	1 35		14	0 0		22	1 43		30	3 22	
7	1 24		15	0 13	Sub.	23	1 56				
8	1 12		16	0 26		24	2 8				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for

NORTH SHIELDS add 6 m.

LEITH add 12 m.

THURSO add 14 m.

TIDE TABLES FOR THE

JUNE, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTER.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
		H. M.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.					
W.	19	m 20	9 1 9 1	9 33 9 2	8 28 23 5	8 56 23 10	2 56 18 3	3 29																		
Th.	20	10 13	10 2 9 3	10 27 9 3	9 22 24 2	9 45 24 6	4 1 19 1	4 28																		
F.	31	11 6	10 52 9 4	11 19 9 4	10 9 24 9	10 33 24 17	4 55 19 9	5 24																		
S.	4	12 0	11 43 9 4	— —	10 56 24 11	11 18 25 0	5 48 20 0	6 9																		
S.	5	0 52	0 6 9 5	0 28 9 5	11 39 25 0	12 0 24 10	6 30 20 1	6 51																		
M.	6	1 43	0 49 9 5	1 8 9 5	— —	0 19 24 9	7 9 19 11	7 27																		
Tu.	7	2 32	1 27 9 4	1 46 9 4	0 38 24 7	0 57 24 3	7 46 19 5	8 5																		
W.	8	3 18	2 5 9 3	2 23 9 2	1 15 23 11	1 33 23 7	8 24 18 11	8 43																		
Th.	9	4 3	2 41 9 1	2 59 9 0	1 51 23 2	2 10 22 10	9 2 18 4	9 20																		
F.	10	4 45	3 18 8 11	3 39 8 10	2 29 22 5	2 49 22 0	9 40 17 7	9 59																		
S.	11	5 27	4 0 8 9	4 21 8 8	3 10 21 7	3 31 21 2	10 18 16 11	10 37																		
S.	12	6 9	4 42 8 7	5 5 8 6	3 54 20 9	4 20 20 5	10 57 16 2	11 19																		
M.	13	6 52	5 31 8 5	5 59 8 4	4 48 20 2	5 20 20 1	11 44 15 8	—																		
Tu.	14	7 37	6 29 8 3	6 59 8 2	5 53 20 1	6 28 20 3	0 11 15 7	0 40																		
W.	15	8 24	7 32 8 3	8 4 8 4	7 22 20 6	7 33 20 11	1 16 15 9	1 52																		
Th.	16	9 14	8 35 8 6	9 4 8 8	8 4 21 5	8 30 22 0	2 27 16 6	2 58																		
F.	17	10 8	9 31 8 10	9 57 8 11	8 55 22 7	9 19 23 2	3 27 17 7	3 55																		
S.	18	11 5	10 23 9 1	10 48 9 2	9 42 23 9	10 5 24 4	4 23 18 9	4 51																		
S.	19	morn.	11 13 9 4	11 38 9 5	10 28 24 9	10 52 25 2	5 17 19 10	5 43																		
M.	20	0 4	— —	0 3 9 7	11 15 25 7	11 39 26 0	6 7 20 7	6 30																		
Tu.	21	1 3	0 27 9 8	0 51 9 9	— —	0 22 26 3	6 54 21 3	7 16																		
W.	22	2 2	1 14 9 10	1 37 11 11	0 25 26 5	0 48 26 5	7 38 21 4	1 1																		
Th.	23	2 58	2 0 9 11	2 24 9 11	1 11 26 4	1 35 26 0	8 25 21 2	8 49																		
F.	24	3 52	2 48 9 10	3 12 9 9	1 58 25 9	2 23 25 3	9 15 20 6	9 39																		
S.	25	4 45	3 37 9 8	4 3 9 6	2 48 24 10	3 14 24 4	10 3 19 7	10 27																		
S.	26	5 36	4 29 9 4	4 56 9 3	3 40 23 8	4 8 23 1	10 51 18 6	11 15																		
M.	27	6 26	5 23 9 1	5 51 8 11	4 38 22 6	5 9 22 0	11 39 17 5	—																		
Tu.	28	7 17	6 22 8 9	6 54 8 7	5 44 21 9	6 21 21 7	0 5 17 1	0 35																		
W.	29	8 9	7 28 8 7	8 5 8 7	6 58 21 8	7 34 21 9	1 12 16 9	1 53																		
Th.	30	9 1	8 39 8 8	9 12 8 9	8 7 12 1	8 38 22 5	2 30 17 1	3 7																		
Half Mean Spring } Range.			4 ^{ft.}	10 ^{in.}	13 ^{ft.} 0 ^{in.}								10 ^{ft.} 6 ^{in.}													
Phases of the Moon.										Moon's Declination at Noon.																
D. H. M.										M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'					
New	4	11	40	Morning.	1	14	N. 13	9	11	N. 3	17	18	8.22	25												
First Quarter	12	11	48	Morning.	11	17	14	10	7	22	18	19	56	26												
Full	19	10	54	Afternoon.	3	19	16	11	3	24	19	20	19	27												
Last Quarter	26	2	15	Afternoon.	4	20	15	12	0	8.43	20	19	24	28												
										5	20	9	13	4	51	21	17	13	29							
In Apogee	10	3	0	Afternoon.	6	19	3	14	8	52	22	13	54	30												
In Perigee	22	1	0	Afternoon.	7	17	3	15	12	35	23	9	44													
										8	14	20	16	15	50	24	5	1								

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 GREENOCK add 19 m. LIVERPOOL add 13 m. PEMBROKE add 20 m.

JUNE, 1864.

VESTON-SUPER-MARE.												HOLYHEAD.												KINGSTOWN.												C's AGE AT NOON.
MORNING.						AFTERNOON.						MORNING.						AFTERNOON.						MORNING.						AFTERNOON.						
Time.		Height.				Time.		Height.				Time.		Height.				Time.		Height.				Time.		Height.				D.						
H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.									
3	32	32	10	4	7	33	4	7	24	14	6	7	52	14	9	8	14	10	0	8	45	10	2	26.5												
4	41	34	0	5	9	34	7	8	18	14	11	8	41	15	1	9	15	10	3	9	40	10	4	27.5												
5	37	35	2	6	5	35	6	9	3	15	3	9	27	15	4	10	3	10	6	10	26	10	7	28.5												
5	30	35	7	6	52	35	7	9	50	15	5	10	11	15	5	10	47	10	8	11	7	10	8	●												
7	14	35	8	7	35	35	8	10	30	15	5	10	47	15	4	11	28	10	8	11	48	10	7	1.0												
7	53	35	6	8	11	35	3	11	5	15	2	11	23	15	0	—	—	—	—	0	7	10	6	2.0												
8	29	34	11	8	47	34	7	11	43	14	10	—	—	—	0	0	26	10	5	0	46	10	3	3.0												
9	4	34	3	9	20	33	10	0	3	14	8	0	23	14	6	1	6	10	2	1	26	10	0	4.0												
9	37	33	3	9	54	32	8	0	43	14	3	1	4	14	0	1	44	9	10	2	4	9	8	5.0												
0	11	32	1	10	28	31	5	1	26	13	9	1	49	13	6	2	26	9	7	2	49	9	5	6.0												
0	45	30	9	11	4	30	2	2	12	13	4	2	35	13	1	3	11	9	4	3	34	9	3	7.0												
1	26	29	8	11	51	29	2	2	59	12	11	3	27	12	9	3	58	9	1	4	25	9	0	8.0												
—	—	—	—	0	19	28	10	3	56	12	8	4	29	12	7	4	54	8	10	5	23	8	10	9.0												
0	48	28	9	1	19	28	9	5	1	12	8	5	32	12	9	5	52	8	10	6	21	8	11	10.0												
1	53	29	0	2	26	29	6	6	3	12	11	6	32	13	2	6	50	9	1	7	19	9	3	11.0												
2	59	30	1	3	32	30	10	7	0	13	4	7	26	13	8	7	48	9	5	8	16	9	7	12.0												
4	43	1	7	4	34	32	7	7	51	14	0	8	14	14	4	8	43	9	9	9	10	9	11	13.0												
5	3	33	6	5	32	34	5	8	37	14	8	9	0	15	0	9	36	10	1	10	0	10	4	14.0												
5	59	35	3	6	25	35	10	9	23	15	4	9	45	15	7	10	22	10	6	10	43	10	8	15.0												
6	49	36	6	7	13	37	1	10	8	15	9	10	29	16	0	11	5	10	11	11	27	11	0	16.0												
7	37	37	8	7	59	37	10	10	50	16	2	11	11	16	2	11	50	11	0	—	—	—	—	17.0												
8	21	37	11	8	43	38	0	11	33	16	2	11	58	16	2	0	14	11	0	0	37	11	0	18.0												
9	6	37	9	9	28	37	6	—	—	—	—	0	24	16	0	1	1	10	11	1	26	10	10	19.0												
9	51	36	10	10	13	36	3	0	50	15	10	1	18	15	7	1	51	10	8	2	18	10	6	20.0												
0	34	35	5	10	56	34	5	1	46	15	3	2	14	15	0	2	46	10	5	3	14	10	3	21.0												
1	19	33	6	11	44	32	6	2	43	14	7	3	13	14	3	3	42	10	0	4	11	9	10	22.0												
—	—	—	—	0	11	31	9	3	45	14	0	4	17	13	9	4	44	9	8	5	15	9	6	23.0												
0	41	31	2	1	14	30	9	4	53	13	8	5	26	13	7	5	45	9	4	6	16	9	4	24.0												
1	49	30	8	2	26	31	8	5	59	13	7	6	33	13	8	6	47	9	5	7	20	9	6	25.0												
3	3	31	0	3	41	31	5	7	3	13	9	7	34	13	11	7	52	9	7	8	24	9	8	26.0												
Mean Spring } 18ft. 7in. Range.												8ft. 0in.												5ft. 6in.												

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
2 25		9	1 1		17	0 38		25	2 21	
2 16		10	0 49		18	0 51		26	2 34	
2 6		11	0 37		19	1 4		27	2 46	
1 56		12	0 25		20	1 17		28	2 58	
1 46		13	0 12		21	1 30		29	3 10	
1 35		14	0 0		22	1 43		30	3 22	
1 24		15	0 13	Sub.	23	1 56				
1 12		16	0 26		24	2 8				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
-SUPER-MARE add 12 m. ! HOLYHEAD add 18 m. ! KINGSTOWN subtract 1 m. for Dublin Time.

TIDE TABLES FOR THE

JUNE, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	
W.	1	9m20	7 58	8 8	8 26	8 10	5 12	7 0	5 37	7 1	2 30	9 9	2 57	10	
Th.	2	10 13	8 52	9 0	9 15	9 1	6 1	7 2	6 26	7 3	3 21	10 2	3 43	10	
F.	3	11 6	9 39	9 2	10 4	9 3	6 51	7 4	7 17	7 4	4 5	10 7	4 29	10	
S.	4	12 0	10 26	9 3	10 47	9 3	7 40	7 5	8 0	7 5	4 53	10 9	5 14	10	
S.	5	0a52	11 7	9 3	11 25	9 2	8 20	7 5	8 38	7 4	5 35	10 10	5 55	10	
M.	6	1 43	11 43	9 2	—	—	8 55	7 3	9 12	7 1	6 13	10 8	6 31	10	
Tu.	7	2 32	0 1	9 1	0 21	9 0	9 30	6 11	9 48	6 10	6 51	10 3	7 11	10	
W.	8	3 18	0 42	9 0	1 2	8 11	10 5	6 8	10 23	6 7	7 29	9 10	7 47	9	
Th.	9	4 3	1 22	8 10	1 43	8 9	10 43	6 5	11 5	6 3	8 6	9 4	8 27	9	
F.	10	4 45	2 7	8 8	2 31	8 7	11 32	6 1	12 0	5 10	8 50	8 11	9 15	8	
S.	11	5 27	2 54	8 5	3 17	8 4	—	—	0 29	5 8	9 40	8 7	10 7	8	
S.	12	6 9	3 41	8 3	4 7	8 2	1 0	5 7	1 32	5 7	10 36	8 5	11 6	8	
M.	13	6 52	4 35	8 2	5 4	8 1	2 8	5 7	2 41	5 8	11 37	8 4	—	—	
Tu.	14	7 37	5 34	8 1	6 3	8 1	3 11	5 9	3 39	5 11	0 7	8 4	0 37	8	
W.	15	8 24	6 34	8 1	7 5	8 2	4 7	6 1	4 31	6 3	1 8	8 6	1 38	8	
Th.	16	9 14	7 34	8 5	8 1	8 4	4 55	6 5	5 16	6 7	2 7	8 11	2 33	9	
F.	17	10 8	8 25	8 6	8 48	8 9	5 37	6 8	5 58	6 10	2 56	9 5	3 18	9	
S.	18	11 5	9 12	8 11	9 36	9 1	6 22	7 0	6 47	7 2	3 40	10 0	4 2	10	
S.	19	morn.	9 59	9 3	10 21	9 4	7 11	7 4	7 35	7 5	4 25	10 7	4 48	10	
M.	20	0 4	10 44	9 5	11 6	9 5	7 58	7 7	8 20	7 9	5 12	11 1	5 35	11	
Tu.	21	1 3	11 28	9 6	11 50	9 6	8 41	7 10	9 1	7 9	5 58	11 4	6 20	11	
W.	22	2 2	—	—	0 12	9 6	9 22	7 8	9 43	7 7	6 42	11 3	7 6	11	
Th.	23	2 58	0 37	9 6	1 3	9 5	10 6	7 6	10 30	7 5	7 30	10 11	7 54	10	
F.	24	3 52	1 29	9 5	1 57	9 4	10 57	7 3	11 25	7 1	8 20	10 6	8 47	10	
S.	25	4 45	2 27	9 3	2 56	9 1	11 59	6 10	—	—	9 15	10 0	9 47	9	
S.	26	5 36	3 25	8 11	3 55	8 9	0 35	6 6	1 12	6 4	10 20	9 6	10 55	9	
M.	27	6 26	4 26	8 8	4 56	8 7	1 51	6 3	2 29	6 2	11 28	9 2	12 0	9	
Tu.	28	7 17	5 27	8 6	5 57	8 5	3 4	6 3	3 35	6 4	—	—	0 31	9	
W.	29	8 9	6 30	8 4	7 6	8 4	4 4	6 5	4 32	6 6	1 4	9 0	1 38	9	
Th.	30	9 1	7 37	8 4	8 8	8 5	4 57	6 7	5 22	6 8	2 10	9 2	2 40	9	
Half Mean Spring } Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'
New - - - - -	4	11	40	Morning.	1	14	N. 13	11	N. 3	17	18	22	25	0	8.
First Quarter	12	11	48	Morning.	2	17	14	10	7 22	18	19	56	26	4	N. 4
Full - - - - -	19	10	54	Afternoon.	3	19	16	11	3 24	19	20	19	27	9	1
Last Quarter -	26	2	15	Afternoon.	4	20	15	12	0 8. 43	20	19	24	28	13	1
					5	20	9	13	4 51	21	17	13	29	16	2
In Apogee - -	10	3	0	Afternoon.	6	19	3	14	8 52	22	13	54	30	18	4
In Perigee - -	22	1	0	Afternoon.	7	17	3	15	12 35	23	9	44			
					8	14	20	16	15 50	24	5	1			

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—

BELFAST subtract 3 m.

LONDONDERRY add 4 m.

SLIGO BAY add 9 m.

JUNE, 1864.

GALWAY.								QUEENSTOWN.								WATERFORD.								C's Age at Noon.
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
No.	Height.	Time.	Height.	No.	Height.	Time.	Height.	No.	Height.	Time.	Height.	No.	Height.	Time.	Height.	No.	Height.	Time.	Height.	No.	Height.	Time.	Height.	
M.	F.	I.	H. M. F. I.	M.	F.	I.	H. M. F. I.	M.	F.	I.	H. M. F. I.	M.	F.	I.	H. M. F. I.	M.	F.	I.	H. M. F. I.	M.	F.	I.	H. M. F. I.	D.
41	12	11	2 9 13 2	1	53	10	5	2	25	10	7	2	3	11	2	2	37	11	4	26.5				
37	13	5	3 2 13 7	2	55	10	9	3	20	10	11	3	10	11	6	3	38	11	8	27.5				
26	13	9	3 50 13 11	3	46	11	1	4	13	11	2	4	6	11	10	4	34	11	11	28.5				
13	14	0	4 33 14 1	4	36	11	3	4	58	11	4	4	59	11	11	5	20	11	11	●				
54	14	2	5 15 14 1	5	20	11	4	5	41	11	3	5	41	11	11	6	2	11	11	1.0				
34	14	0	5 52 13 10	6	0	11	2	6	19	11	1	6	21	11	11	6	40	11	10	2.0				
11	13	7	6 31 13 5	6	38	11	0	6	57	10	10	7	0	11	9	7	18	11	8	3.0				
50	13	2	7 9 12 11	7	15	10	8	7	33	10	6	7	36	11	7	7	53	11	6	4.0				
29	12	9	7 51 12 5	7	52	10	4	8	11	10	2	8	11	11	4	8	29	11	2	5.0				
14	12	1	8 36 11 9	8	30	10	0	8	50	9	10	8	48	11	0	9	6	10	10	6.0				
58	11	5	9 21 11 2	9	10	9	8	9	29	9	6	9	24	10	8	9	45	10	6	7.0				
46	11	0	10 14 10 10	9	51	9	4	10	15	9	3	10	9	10	4	10	37	10	2	8				
45	10	10	11 16 10 10	10	44	9	2	11	14	9	2	11	5	10	0	11	33	9	11	9.0				
48	10	11	— —	11	45	9	2	— —	— —	— —	— —	0	1	9	10	10.0								
20	11	1	0 50 11 4	0	17	9	3	0	50	9	5	0	30	10	0	1	1	10	1	11.0				
18	11	8	1 44 12 0	1	23	9	7	1	54	9	9	1	32	10	4	2	3	10	7	12.0				
8	12	4	2 33 12 9	2	23	10	0	2	50	10	4	2	34	10	10	3	4	11	1	13.0				
58	13	1	3 22 13 6	3	16	10	7	3	42	10	10	3	33	11	4	4	1	11	7	14.0				
45	13	10	4 8 14 2	4	7	11	1	4	31	11	4	4	28	11	10	4	54	12	0	○				
31	14	6	4 54 14 9	4	55	11	7	5	19	11	9	5	18	12	2	5	41	12	4	16.0				
17	14	11	5 40 15 1	5	43	11	10	6	7	11	11	6	4	12	6	6	27	12	7	17.0				
3	15	1	6 26 15 0	6	29	11	11	6	52	11	11	6	50	12	8	7	13	12	8	18.0				
51	14	10	7 16 14 8	7	16	11	9	7	40	11	8	7	37	12	8	8	1	12	7	19.0				
43	14	5	8 11 14 1	8	5	11	6	8	30	11	3	8	25	12	5	8	48	12	3	20.0				
39	13	7	9 7 13 1	8	54	11	c	9	19	10	9	9	11	12	0	9	34	11	9	21.0				
35	12	8	10 5 12 4	9	44	10	6	10	9	10	3	9	59	11	6	10	28	11	2	☾				
35	12	1	11 8 11 11	10	35	10	0	11	7	9	10	10	57	10	11	11	27	10	8	23.0				
42	11	10	— —	11	40	9	9	— —	— —	— —	— —	11	57	10	6	— —	— —	— —	— —	24.0				
16	11	10	0 50 11 11	0	14	9	9	0	51	9	9	0	27	10	6	1	1	10	6	25.0				
21	12	1	1 51 12 4	1	27	9	10	2	3	10	0	1	35	10	7	2	12	10	9	26.0				
Mean Spring } Tide. }				7ft. 5in.				5ft 10in.				6ft. 2in.												

Equation of Time at Noon.

M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
2	25		9	1	1		17	0	38		25	2	21	
2	16		10	0	49		18	0	51		26	2	34	
2	6		11	0	37		19	1	4		27	2	46	
1	56		12	0	25		20	1	17		28	2	58	
1	46		13	0	12		21	1	30		29	3	10	
1	35		14	0	0		22	1	43		30	3	22	
1	24		15	0	13	Sub.	23	1	56					
1	12		16	0	26		24	2	8					

of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
ALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 8 m.
D

JULY, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRAMIT.	GREENOCK.				LIVERPOOL.				PRMBROKE.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTER.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
Tu.	1	9m54	9 44	8 10	10 12	8 11	9 7	22 9	9 32	23 1	3 40	17 10	4 11		
W.	2	10 46	10 38	9 0	11 3	9 0	9 57	23 6	10 19	23 9	4 40	18 6	5 6		
Th.	3	11 37	11 27	9 2	11 50	9 2	10 41	23 11	11 3	24 1	5 31	19 1	5 55		
M.	4	12 26	—	—	0 11	9 3	11 23	24 3	11 43	24 5	6 15	19 6	6 34		
Tu.	5	1 13	0 32	9 3	0 52	9 4	—	—	0 3	24 6	6 54	19 8	7 11		
W.	6	1 58	1 10	9 4	1 28	9 4	0 20	24 6	0 38	24 6	7 28	19 7	7 45		
Th.	7	2 42	1 45	9 4	2 2	9 4	0 55	24 4	1 11	24 3	8 2	19 5	8 19		
F.	8	3 24	2 18	9 3	2 39	9 3	1 28	24 0	1 45	23 9	8 36	19 1	8 54		
S.	9	4 6	2 53	9 2	3 10	9 1	2 3	23 5	2 20	23 1	9 12	18 6	9 28		
M.	10	4 48	3 26	9 0	3 44	8 11	2 37	23 9	2 54	22 4	9 45	17 10	10 3		
Tu.	11	5 31	4 3	8 10	4 24	8 9	3 14	21 11	3 35	21 6	10 22	17 2	10 42		
W.	12	6 16	4 46	8 8	5 10	8 6	3 58	21 0	4 24	20 7	11 3	16 3	11 25		
Th.	13	7 3	5 35	8 5	6 5	8 4	4 52	20 3	5 26	20 0	11 50	15 7	—		
F.	14	7 54	6 38	8 3	7 11	8 2	6 3	20 1	6 40	20 3	0 20	15 7	0 53		
S.	15	8 49	7 46	8 3	8 22	8 5	7 16	20 8	7 50	21 2	1 32	15 9	2 11		
M.	16	9 47	8 55	8 7	9 28	8 9	8 24	21 9	8 53	22 6	2 48	16 9	3 23		
Tu.	17	10 46	9 58	9 0	10 27	9 2	9 21	23 3	9 47	24 1	3 56	18 3	4 27		
W.	18	11 46	10 54	9 4	11 20	9 6	10 11	24 9	10 35	25 5	4 57	19 9	5 24		
Th.	19	morn.	11 46	9 8	—	—	10 59	26 0	11 24	26 7	5 51	21 0	6 16		
F.	20	0 45	0 12	9 10	0 36	10 0	11 48	27 0	—	—	6 39	21 11	7 2		
S.	21	1 42	1 0	10 1	1 24	10 2	0 11	27 4	0 35	27 6	7 25	22 4	7 48		
M.	22	2 37	1 47	10 2	2 10	10 2	0 58	27 7	1 21	27 4	8 11	22 2	8 31		
Tu.	23	3 30	2 33	10 1	2 57	10 0	1 44	26 11	2 7	26 5	8 59	21 6	9 25		
W.	24	4 22	3 20	9 10	3 42	9 8	2 30	25 9	2 52	25 0	9 43	20 3	10 4		
Th.	25	5 14	4 4	9 6	4 28	9 4	3 15	24 3	3 39	23 6	10 27	18 12	10 51		
F.	26	6 6	4 55	9 1	5 22	8 10	4 6	23 7	4 36	21 10	11 14	17 4	11 36		
S.	27	6 58	5 51	8 8	6 25	8 5	5 9	21 8	5 47	20 9	—	—	0 8		
M.	28	7 50	7 1	8 3	7 39	8 3	6 29	20 6	7 9	20 6	0 43	15 10	1 21		
Tu.	29	8 42	8 18	8 4	8 54	8 5	7 46	20 9	8 23	21 1	1 2	15 11	2 4		
W.	30	9 33	9 27	8 6	9 57	8 8	8 52	21 7	9 20	22 1	3 22	16 8	3 5		
Th.	31	10 22	10 24	8 9	10 48	8 10	9 45	22 7	10 7	23 1	4 24	17 8	4 50		
Half Mean Spring Range.			4 ^{ft.} 10 ^{in.}				13 ^{ft.} 0 ^{in.}				10 ^{ft.} 6 ^{in.}				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'
New	—	—	4	0	24	Morning.	1	20	N. 3	9	0	N. 44	17	19	54
First Quarter	—	—	12	3	51	Morning.	2	20	17	10	3	8. 22	18	18	17
Full	—	—	19	6	36	Morning.	3	19	30	11	7	22	19	15	24
Last Quarter	—	—	25	8	46	Afternoon.	4	17	49	12	11	9	20	11	28
In Apogee	—	—	8	8	0	Morning.	5	13	20	13	14	32	21	6	48
In Perigee	—	—	20	2	0	Afternoon.	6	13	14	14	17	20	22	1	47
							7	8	40	15	19	18	23	3	N. 15
							8	4	47	16	20	13	24	8	0

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 GREENOCK add 19 m. LIVERPOOL add 12 m. PMBROKE add

JULY, 1864.

WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's Age at Noon.
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.							
18 31 11	4 51 32 6	8 3 14 1	8 28 14 3	8 56 9 9	9 25 9 11	27° 0																		
21 33 2	5 47 33 8	8 52 14 6	9 14 14 8	9 52 10 0	10 14 10 2	28° 0																		
12 34 0	6 37 34 4	9 36 14 9	9 57 14 11	10 34 10 3	10 53 10 4	29° 0																		
58 34 7	7 18 34 10	10 16 15 0	10 34 15 1	11 13 10 5	11 32 10 6	●																		
38 35 1	7 54 35 1	10 52 15 1	11 7 15 1	11 51 10 5	—	1° 5																		
11 35 1	8 28 35 0	11 23 15 0	11 41 14 11	0 9 10 5	0 27 10 4	2° 5																		
44 34 11	9 0 34 8	11 59 14 10	—	0 44 10 3	1 2 10 3	3° 5																		
16 34 6	9 32 34 2	0 17 14 9	0 36 14 7	1 20 10 2	1 38 10 0	4° 5																		
48 33 8	10 2 33 2	0 56 14 5	1 15 14 2	1 57 9 11	2 15 9 9	5° 5																		
17 32 7	10 32 31 11	1 34 14 0	1 54 13 9	2 34 9 8	2 54 9 7	6° 5																		
50 31 3	11 9 30 6	2 15 13 6	2 38 13 3	3 14 9 5	3 37 9 4	7° 5																		
30 29 10	11 55 29 3	3 3 13 0	3 31 12 10	4 1 9 2	4 29 9 0	8° 5																		
—	0 25 28 10	4 0 12 8	4 35 12 7	4 58 8 11	5 29 8 10	9° 5																		
57 28 8	1 31 28 9	5 11 12 8	5 44 12 9	6 1 8 10	6 32 8 11	10° 5																		
7 29 1	2 44 29 8	6 17 13 0	6 49 13 3	7 4 9 1	7 36 9 3	11° 5																		
22 30 6	3 59 31 6	7 20 13 6	7 49 14 0	8 8 9 6	8 40 9 9	12° 5																		
35 32 8	5 8 33 11	8 17 14 5	8 43 14 10	9 11 10 0	9 41 10 3	13° 5																		
38 35 1	6 6 36 2	9 6 15 3	9 29 15 8	10 6 10 6	10 28 10 9	14° 5																		
33 37 1	6 58 37 11	9 53 16 1	10 16 16 5	10 50 11 0	11 13 11 2	○																		
23 38 8	7 46 39 3	10 38 16 8	10 58 16 10	11 36 11 4	11 59 11 4	16° 5																		
9 39 6	8 31 39 7	11 20 16 11	11 43 16 11	—	0 23 11 5	17° 5																		
53 39 5	9 15 39 0	—	0 9 16 10	0 47 11 4	1 12 11 3	18° 5																		
37 38 5	9 59 37 6	0 34 16 6	1 0 16 3	1 36 11 1	2 1 10 11	19° 5																		
17 36 6	10 35 35 4	1 25 15 10	1 50 15 5	2 26 10 8	2 50 10 5	20° 5																		
55 34 1	11 18 32 10	2 15 14 11	2 42 14 6	3 14 10 2	3 41 9 11	☾																		
42 31 7	—	3 11 14 0	3 43 13 7	4 10 9 8	4 41 9 5	22° 5																		
11 30 6	0 44 29 7	4 17 13 3	4 56 13 0	5 14 9 2	5 48 9 0	23° 5																		
21 29 2	2 0 29 0	5 34 12 11	6 10 12 11	6 22 9 0	6 57 9 1	24° 5																		
40 29 2	3 20 29 7	6 45 13 0	7 19 13 2	7 32 9 2	8 6 9 3	25° 5																		
57 30 2	4 32 30 11	7 48 13 5	8 16 13 8	8 38 9 5	9 10 9 7	26° 5																		
43 1 9	5 31 32 7	8 41 13 11	9 2 14 3	9 38 9 9	10 1 9 11	27° 5																		
an Spring } 18ft. 7in.								8ft. 0in.								5ft. 6in.								

Equation of Time at Noon.

L. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
3 34	Sub.	9	4 56	Sub.	17	5 51	Sub.	25	6 12	Sub.
3 45		10	5 5		18	5 56		26	6 12	
3 56		11	5 13		19	6 0		27	6 12	
4 7		12	5 20		20	6 3		28	6 11	
4 18		13	5 28		21	6 6		29	6 9	
4 28		14	5 34		22	6 9		30	6 7	
4 38		15	5 40		23	6 10		31	6 4	
4 47		16	5 46		24	6 12				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

TIDE TABLES FOR THE

JULY, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRAMBIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	
S.	1	9m 54	9 44	8 10	10 12	8 11	9 7 22	9 9 32 23	1 3 40	17 10	4 11	1	4 11	1	
S.	2	10 46	10 38	9 0	11 3	9 0	9 57 23	6 10 19 23	9 4 40	18 6	5 6	1	5 6	1	
M.	3	11 37	11 27	9 1	11 50	9 2	10 41 23	11 11 3 24	1 5 31	19 1	5 55	1	5 55	1	
M.	4	0 26	—	—	0 11	9 3	11 23 24	3 11 43 24	5 6 15	19 6	6 34	1	6 34	1	
Tu.	5	1 13	0 32	9 3	0 52	9 4	—	—	0 3 24	6 6 54	19 8	7 11	1	7 11	1
W.	6	1 58	1 10	9 4	1 28	9 4	0 20 24	6 0 38 24	6 7 28	19 7	7 45	1	7 45	1	
Th.	7	2 42	1 45	9 4	2 1	9 4	0 55 24	4 1 11 24	2 8 2	19 5	8 19	1	8 19	1	
F.	8	3 24	2 18	9 3	2 35	9 3	1 28 24	0 1 45 23	9 8 36	19 1	8 54	1	8 54	1	
S.	9	4 6	2 53	9 2	3 10	9 1	2 3 23	5 2 20 23	1 9 12	18 6	9 28	1	9 28	1	
S.	10	4 48	3 26	9 0	3 44	8 11	2 37 22	9 2 54 22	4 9 45	17 10	10 3	1	10 3	1	
M.	11	5 31	4 3	8 10	4 24	8 9	3 14 21	11 3 35 21	6 10 22	17 2	10 42	1	10 42	1	
Tu.	12	6 16	4 46	8 8	5 10	8 6	3 58 21	0 4 24 20	7 11 3	16 3	11 25	1	11 25	1	
W.	13	7 3	5 35	8 5	6 5	8 4	4 52 20	3 5 26 20	0 11 50	15 7	—	—	—	—	
Th.	14	7 54	6 38	8 3	7 11	8 2	6 3 20	1 6 40 20	3 0 20	15 7	0 53	1	0 53	1	
F.	15	8 49	7 46	8 3	8 22	8 5	7 16 20	8 7 50 21	2 1 32	15 9	2 11	1	2 11	1	
S.	16	9 47	8 55	8 7	9 28	8 9	8 24 21	9 8 53 22	6 2 48	16 9	3 23	1	3 23	1	
S.	17	10 46	9 58	9 0	10 27	9 2	9 21 23	3 9 47 24	1 3 56	18 3	4 27	1	4 27	1	
M.	18	11 46	10 54	9 4	11 20	9 6	10 11 24	9 10 35 25	5 4 57	19 9	5 24	1	5 24	1	
Tu.	19	morn.	11 46	9 8	—	—	10 59 26	0 11 24 26	7 5 51	21 0	6 16	1	6 16	1	
W.	20	0 45	0 12	9 10	0 36	10 0	11 48 27	0 —	—	—	6 39	21 11	7 2	1	
Th.	21	1 42	1 0	10 1	1 24	10 2	0 11 27	4 0 35 27	6 7 25	22 4	7 48	1	7 48	1	
F.	22	2 37	1 47	10 2	2 10	10 2	0 58 27	7 1 21 27	4 8 11	22 2	8 35	1	8 35	1	
S.	23	3 30	2 33	10 1	2 57	10 0	1 44 26	11 2 7 26	5 8 59	21 6	9 23	1	9 23	1	
S.	24	4 22	3 20	9 10	3 42	9 8	2 30 25	9 2 52 25	0 9 43	20 3	10 4	1	10 4	1	
M.	25	5 14	4 4	9 6	4 28	9 4	3 15 24	3 3 39 23	6 10 27	18 11	10 51	1	10 51	1	
Tu.	26	6 6	4 55	9 1	5 22	8 10	4 6 22	7 4 36 21	10 11 14	17 4	11 38	1	11 38	1	
W.	27	6 58	5 51	8 8	6 25	8 5	5 9 21	2 5 47 20	9 —	—	0 8	1	0 8	1	
Th.	28	7 50	7 1	8 3	7 39	8 3	6 29 20	6 7 9 20	6 0 42	15 10	1 23	1	1 23	1	
F.	29	8 42	8 18	8 4	8 54	8 5	7 46 20	9 8 23 21	1 2 7	15 11	2 47	1	2 47	1	
S.	30	9 33	9 27	8 6	9 57	8 8	8 52 21	7 9 20 22	1 3 22	16 8	3 54	1	3 54	1	
S.	31	10 22	10 24	8 9	10 48	8 10	9 45 22	7 10 7 23	1 4 24	17 8	4 50	1	4 50	1	
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	
New	4	0 24	Morning.				1	20	N. 3	9	0	N. 44	17	19 8. 54	
First Quarter	12	3 51	Morning.				2	20	17	10	3	8. 22	18	18 17	
Full	19	6 36	Morning.				11	19	30	11	7	22	19	15 24	
Last Quarter	25	8 46	Afternoon.				4	17	49	12	11	9	20	11 28	
In Apogee	8	8 0	Morning.				5	15	20	13	14	32	21	6 48	
In Perigee	20	2 0	Afternoon.				6	12	14	14	17	20	22	1 47	
							7	8	40	15	19	18	23	3 N. 15	
							8	4	47	16	20	13	24	8 0	

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 GREENOCK add 19 m. LIVERPOOL add 18 m. PEMBROKE add 0

JULY, 1864.

NORTH SHIELDS.						LEITH.						THURSO.						C's AGE AT NOON.																																																																																																																																																																																																																																																							
MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.																																																																																																																																																																																																																																																										
Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.																																																																																																																																																																																																																																																									
H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.																																																																																																																																																																																																																																																									
6 11 2	1 34 11 4		—	—		0 28 14 1	6 29 10 10		6 52 11 2	27° 0		8 11 6	2 23 11 9		0 53 14 4	1 18 14 8		7 14 11 6	7 33 11 10	28° 0		5 11 11	3 5 12 1		1 41 14 11	2 3 15 1		7 52 12 1	8 12 12 3	29° 0		5 12 3	3 44 12 4		2 24 15 3	2 43 15 4		8 31 12 4	8 49 12 4	●	4 12 5	4 23 12 5		3 1 15 5	3 19 15 5		9 8 12 4	9 25 12 3	1° 5	1 12 4	4 59 12 3		3 36 15 4	3 53 15 2		9 43 12 2	10 0 12 1	2° 5	6 12 1	5 33 12 0		4 10 15 1	4 28 15 0		10 18 11 11	10 36 11 9	3° 5	1 11 11	6 9 11 10		4 46 14 10	5 3 14 9		10 54 11 7	11 13 11 5	4° 5	8 11 8	6 46 11 6		5 22 14 7	5 41 14 5		11 33 11 2	11 52 11 0	5° 5	4 11 4	7 24 11 1		6 0 14 2	6 21 13 11	—	—	0 12 10 9	6° 5	6 10 10	8 10 10 7		6 42 13 7	7 5 13 4	0 34 10 5	0 57 10 2	7° 5	6 10 3	9 5 10 1		7 31 13 1	7 59 12 10	1 22 10 0	1 50 9 9	8° 5	5 9 11	10 10 9 10		8 28 12 8	9 2 12 6	2 19 9 7	2 54 9 6	9° 5	3 9 11	11 16 10 1		9 38 12 7	10 11 12 8	3 33 9 6	4 9 9 6	10° 5	9 10 4	—	—	10 43 12 11	11 15 13 2	4 43 9 7	5 17 9 10	11° 5	12 10 7	0 52 10 11		11 46 13 6	—	—	5 48 10 2	6 16 10 8	12° 5	10 11 3	1 47 11 7		0 14 13 11	0 41 14 5	6 41 11 2	7 5 11 10	13° 5	13 12 0	2 36 12 6		1 7 15 0	1 33 15 6	7 26 12 5	7 47 13 0	14° 5	59 12 11	3 22 13 3		1 57 16 0	2 20 16 5	8 8 13 5	8 31 13 9	⊙	45 13 7	4 8 13 10		2 43 16 9	3 5 17 0	8 53 13 11	9 15 14 1	16° 5	31 14 0	4 55 13 11		3 27 17 1	3 50 17 1	9 39 14 1	10 3 14 0	17° 5	19 13 10	5 43 13 9		4 13 17 0	4 37 16 10	10 27 13 10	10 52 13 7	18° 5	7 13 7	6 32 13 4		5 2 16 8	5 27 16 5	11 17 13 3	11 43 12 10	19° 5	56 13 0	7 20 12 7		5 52 16 0	6 16 15 7	—	—	0 8 12 4	20° 5	45 12 2	8 14 11 8		6 42 15 1	7 9 14 6	0 33 11 11	1 1 11 5	⊙	45 11 2	9 17 10 9		7 40 14 1	8 11 13 7	1 30 10 11	2 2 10 6	22° 5	52 10 5	10 30 10 3		8 45 13 3	9 23 12 11	2 36 10 2	3 16 9 10	23° 5	7 10 2	11 43 10 3		10 1 12 10	10 36 12 10	3 58 9 8	4 36 9 7	24° 5	—	0 18 10 4		11 11 12 11	11 45 13 1	5 13 9 7	5 47 9 9	25° 5	51 10 6	1 20 10 8		—	—	0 14 13 4	6 16 10 1	6 41 10 5	26° 5	46 10 11	2 11 11 2		0 40 13 8	1 5 14 0	7 4 10 10	7 23 11 3	27° 5
In Spring } 6ft. 8in.						8ft. 2in.						6ft. 7in.																																																																																																																																																																																																																																																													
In Spring } 6ft. 8in.						8ft. 2in.						6ft. 7in.																																																																																																																																																																																																																																																													

Equation of Time at Noon.

S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
34	Sub.	9	4 56	Sub.	17	5 51	Sub.	25	6 12	Sub.
45		10	5 5		18	5 56		26	6 12	
56		11	5 13		19	6 0		27	6 12	
7		12	5 20		20	6 3		28	6 11	
18		13	5 28		21	6 6		29	6 9	
28		14	5 34		22	6 9		30	6 7	
38		15	5 40		23	6 10		31	6 4	
47		16	5 46		24	6 12				

High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
N SHIELDS add 6 m. | LEITH add 18 m. | THURSO add 14 m.

JULY, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
P.	1	9m 54	9 44	8 10	10 12	8 11	9 7	22 9	9 32	23 1	3 40	17 10	4 11	18 3	
S.	2	10 40	10 38	9 0	11 3	9 0	9 57	23 6	10 19	23 9	4 40	18 6	5 6	18 10	
S.	3	11 37	11 27	9 1	11 50	9 2	10 41	23 11	11 3	24 1	5 31	19 1	5 55	19 4	
M.	4	0 20	—	—	0 11	9 3	11 23	24 3	11 43	24 5	6 15	19 6	6 34	19 6	
Tu.	5	1 13	0 32	9 3	0 52	9 4	—	—	0 32	24 6	6 54	19 8	7 11	19 8	
W.	6	1 58	1 10	9 4	1 28	9 4	0 20	24 6	0 38	24 6	7 28	19 7	7 45	19 7	
Th.	7	2 42	1 45	9 4	2 1	9 4	0 55	24 4	1 11	24 2	8 2	19 5	8 19	19 5	
F.	8	3 24	2 18	9 3	2 33	9 3	1 28	24 0	1 45	23 9	8 36	19 1	8 54	18 1	
S.	9	4 6	2 53	9 2	3 10	9 1	2 3	23 5	2 20	23 1	9 12	18 6	9 28	18 6	
S.	10	4 48	3 26	9 0	3 44	8 11	2 37	22 9	2 54	22 4	9 45	17 10	10 3	18 4	
M.	11	5 31	4 3	8 10	4 24	8 9	3 14	21 11	3 35	21 6	10 22	17 2	10 42	16 2	
Tu.	12	6 16	4 46	8 8	5 10	8 6	3 58	21 0	4 24	20 7	11 3	16 8	11 25	15 8	
W.	13	7 3	5 35	8 5	6 5	8 4	4 52	20 3	5 26	20 0	11 50	15 7	—	—	
Th.	14	7 54	6 38	8 3	7 11	8 2	6 3	20 1	6 40	20 3	0 20	15 7	0 53	15 4	
F.	15	8 49	7 46	8 3	8 12	8 5	7 16	20 8	7 50	21 2	1 32	15 9	2 11	16 2	
S.	16	9 47	8 55	8 7	9 28	8 9	8 24	21 9	8 53	22 6	2 48	16 9	3 23	17 4	
S.	17	10 46	9 58	9 0	10 27	9 2	9 21	23 3	9 47	24 1	3 56	18 3	4 27	19 4	
M.	18	11 46	10 54	9 4	11 20	9 6	10 11	24 11	10 35	25 5	4 57	19 9	5 24	20 6	
Tu.	19	morn.	11 46	9 8	—	—	10 59	26 0	11 24	26 7	5 51	21 0	6 16	21 6	
W.	20	0 45	0 12	9 10	0 36	10 0	11 48	27 0	—	—	6 39	21 11	7 2	22 3	
Th.	21	1 42	1 0	10 1	1 24	10 2	0 11	27 4	0 35	27 6	7 25	22 4	7 48	22 6	
F.	22	2 37	1 47	10 2	2 10	10 2	0 58	27 7	1 21	27 4	8 11	22 2	8 35	21 8	
S.	23	3 30	2 33	10 1	2 57	10 0	1 44	26 11	2 7	26 5	8 59	21 6	9 23	20 8	
S.	24	4 22	3 20	9 10	3 42	9 8	2 30	25 9	2 52	25 0	9 43	20 3	10 4	19 4	
M.	25	5 14	4 4	9 6	4 28	9 4	3 15	24 3	3 39	23 6	10 27	18 12	10 51	18 2	
Tu.	26	6 6	4 55	9 1	5 22	8 10	4 6	22 7	4 36	21 10	11 14	17 4	11 38	16 4	
W.	27	6 58	5 51	8 8	6 25	8 5	5 9	21 2	5 47	20 9	—	—	0 8	16 7	
Th.	28	7 50	7 1	8 3	7 39	8 3	6 29	20 6	7 9	20 6	0 42	15 10	1 23	15 4	
F.	29	8 42	8 18	8 4	8 54	8 5	7 46	20 9	8 23	21 1	2 7	15 11	2 47	16 1	
S.	30	9 33	9 27	8 6	9 57	8 8	8 52	21 7	9 20	22 1	3 22	16 8	3 54	17 1	
S.	31	10 22	10 24	8 9	10 48	8 10	9 45	22 7	10 7	23 1	4 24	17 8	4 50	18 4	
Half Mean Spring Range.			4 ft. 10 in.				13 ft. 0 in.				10 ft. 6 in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'
New	—	—	4	0	24	Morning.	1	20	N. 3	9	0	N. 44	17	19	N. 54
First Quarter	—	—	12	3	51	Morning.	2	20	17	10	38	22	18	18	17
Full	—	—	19	6	36	Morning.	3	1	30	11	7	22	19	15	24
Last Quarter	—	—	25	8	46	Afternoon.	4	17	49	12	11	9	20	11	28
							5	15	20	13	14	32	21	6	48
In Apogee	—	—	8	8	0	Morning.	6	12	14	14	17	20	22	1	47
In Perigee	—	—	20	2	0	Afternoon.	7	8	40	15	19	18	23	3	N. 15
							8	4	47	16	20	13	24	8	0

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

JULY, 1864.

WESTON-SUPER-MARE.										HOLYHEAD.										KINGSTOWN.										C's Age at Noon.	
Morning.					Afternoon.					Morning.					Afternoon.					Morning.					Afternoon.						
Time.	Height.				Time.	Height.				Time.	Height.				Time.	Height.				Time.	Height.				Time.	Height.					
H. M. F. L.	H.	M.	F.	L.	H. M. F. L.	H.	M.	F.	L.	H. M. F. L.	H.	M.	F.	L.	H. M. F. L.	H.	M.	F.	L.	H. M. F. L.	H.	M.	F.	L.	H. M. F. L.	H.	M.	F.	L.	D.	
4 18 31 11	4	18	31	11	4 51 32 6	4	51	32	6	8 3 14 1	8	3	14	1	8 28 14 3	8	28	14	3	8 56 9 9	9	25	9	11	9 25 9 11	9	25	9	11	27°0	
5 21 33 2	5	21	33	2	5 47 33 8	5	47	33	8	8 52 14 6	8	52	14	6	9 14 14 8	9	52	10	0	9 52 10 0	10	14	10	2	10 14 10 2	10	14	10	2	28°0	
6 12 34 0	6	12	34	0	6 37 34 4	6	37	34	4	9 36 14 9	9	36	14	9	9 57 14 11	10	34	10	3	10 34 10 3	10	53	10	4	10 53 10 4	10	53	10	4	29°0	
6 58 34 7	6	58	34	7	7 18 34 10	7	18	34	10	10 16 15 0	10	16	15	0	10 34 15 1	11	13	10	5	11 13 10 5	11	32	10	6	11 32 10 6	11	32	10	6	●	
7 38 35 1	7	38	35	1	7 54 35 1	7	54	35	1	10 52 15 1	10	52	15	1	11 7 15 1	11	51	10	5	—	—	—	—	—	—	—	—	—	—	1°5	
8 11 35 1	8	11	35	1	8 28 35 0	8	28	35	0	11 23 15 0	11	23	15	0	11 41 14 11	0	9	10	5	0 9 10 5	0	27	10	4	0 27 10 4	0	27	10	4	2°5	
8 44 34 11	8	44	34	11	9 0 34 8	9	0	34	8	11 59 14 10	11	59	14	10	—	—	0 44 10 3	1	2 10 3	1	2 10 3	1	2 10 3	1	2 10 3	1	2 10 3	1	2 10 3	3°5	
9 16 34 6	9	16	34	6	9 32 34 2	9	32	34	2	0 17 14 9	0	17	14	9	0 36 14 7	1	20 10 2	1	38 10 0	1	38 10 0	1	38 10 0	1	38 10 0	1	38 10 0	1	38 10 0	4°5	
9 48 33 8	9	48	33	8	10 2 33 2	10	2	33	2	0 56 14 5	0	56	14	5	1 15 14 2	1	57 9 11	2	15 9 9	1	57 9 11	2	15 9 9	1	57 9 11	2	15 9 9	1	57 9 11	5°5	
0 17 32 7	0	17	32	7	10 32 31 11	10	32	31	11	1 34 14 0	1	34	14	0	1 54 13 9	2	34 9 8	2	54 9 7	2	34 9 8	2	54 9 7	2	34 9 8	2	54 9 7	2	34 9 8	6°5	
0 50 31 3	0	50	31	3	11 9 30 6	11	9	30	6	2 15 13 6	2	15	13	6	2 38 13 3	3	14 9 5	3	37 9 4	3	14 9 5	3	37 9 4	3	14 9 5	3	37 9 4	3	14 9 5	7°5	
1 30 29 10	1	30	29	10	11 55 29 3	11	55	29	3	3 3 13 0	3	3	13	0	3 31 12 10	4	1 9 2	4	29 9 0	4	1 9 2	4	29 9 0	4	1 9 2	4	29 9 0	4	1 9 2	8°5	
—	—	—	—	—	0 25 28 10	0	25	28	10	4 0 12 8	4	0	12	8	4 35 12 7	4	58 8 11	5	29 8 10	5	29 8 11	5	29 8 10	5	29 8 11	5	29 8 10	5	29 8 11	9°5	
0 57 28 8	0	57	28	8	1 31 28 9	1	31	28	9	5 11 12 8	5	11	12	8	5 44 12 9	6	1 8 10	6	32 8 11	6	1 8 10	6	32 8 11	6	1 8 10	6	32 8 11	6	1 8 10	10°5	
2 7 29 1	2	7	29	1	2 44 29 8	2	44	29	8	6 17 13 0	6	17	13	0	6 49 13 3	7	4 9 1	7	36 9 3	7	4 9 1	7	36 9 3	7	4 9 1	7	36 9 3	7	4 9 1	11°5	
3 22 30 6	3	22	30	6	3 59 31 6	3	59	31	6	7 20 13 6	7	20	13	6	7 49 14 0	8	8 9 6	8	40 9 9	8	8 9 6	8	40 9 9	8	8 9 6	8	40 9 9	8	8 9 6	12°5	
4 35 32 8	4	35	32	8	5 8 33 11	5	8	33	11	8 17 14 5	8	17	14	5	8 43 14 10	9	11 10 0	9	41 10 3	9	11 10 0	9	41 10 3	9	11 10 0	9	41 10 3	9	11 10 0	13°5	
5 38 35 1	5	38	35	1	6 6 36 2	6	6	36	2	9 6 15 3	9	6	15	3	9 29 15 8	10	6 10 6	10	28 10 9	10	6 10 6	10	28 10 9	10	6 10 6	10	28 10 9	10	6 10 6	14°5	
6 33 37 1	6	33	37	1	6 58 37 11	6	58	37	11	9 53 16 1	9	53	16	1	10 16 16 5	10	50 11 0	11	13 11 2	11	50 11 0	11	13 11 2	11	50 11 0	11	13 11 2	11	50 11 0	○	
7 23 38 8	7	23	38	8	7 46 39 3	7	46	39	3	10 38 16 8	10	38	16	8	10 58 16 10	11	36 11 4	11	59 11 4	11	36 11 4	11	59 11 4	11	36 11 4	11	59 11 4	11	36 11 4	16°5	
8 9 39 6	8	9	39	6	8 31 39 7	8	31	39	7	11 20 16 11	11	20	16	11	11 43 16 11	—	—	—	—	0 23 11 5	0	23 11 5	0	23 11 5	0	23 11 5	0	23 11 5	0	23 11 5	17°5
8 53 39 5	8	53	39	5	9 15 39 0	9	15	39	0	—	—	—	—	—	0 9 16 10	0	47 11 4	1	12 11 3	1	47 11 4	1	12 11 3	1	47 11 4	1	12 11 3	1	47 11 4	18°5	
9 37 38 5	9	37	38	5	9 59 37 6	9	59	37	6	0 34 16 6	0	34	16	6	1 0 16 3	1	36 11 1	2	1 10 11	2	36 11 1	2	1 10 11	2	36 11 1	2	1 10 11	2	36 11 1	19°5	
10 17 36 6	10	17	36	6	10 35 35 4	10	35	35	4	1 25 15 10	1	25	15	10	1 50 15 5	2	26 10 8	2	50 10 5	2	26 10 8	2	50 10 5	2	26 10 8	2	50 10 5	2	26 10 8	20°5	
10 55 34 1	10	55	34	1	11 18 32 10	11	18	32	10	2 15 14 11	2	15	14	11	2 42 14 6	3	14 10 2	3	41 9 11	3	14 10 2	3	41 9 11	3	14 10 2	3	41 9 11	3	14 10 2	☾	
11 42 31 7	11	42	31	7	—	—	—	—	—	3 11 14 0	3	11	14	0	3 43 13 7	4	10 9 8	4	41 9 5	4	10 9 8	4	41 9 5	4	10 9 8	4	41 9 5	4	10 9 8	22°5	
0 11 30 6	0	11	30	6	0 44 29 7	0	44	29	7	4 17 13 3	4	17	13	3	4 56 13 0	5	14 9 2	5	48 9 0	5	14 9 2	5	48 9 0	5	14 9 2	5	48 9 0	5	14 9 2	23°5	
1 21 29 2	1	21	29	2	2 0 29 0	2	0	29	0	5 34 12 11	5	34	12	11	6 10 12 11	6	22 9 0	6	57 9 1	6	22 9 0	6	57 9 1	6	22 9 0	6	57 9 1	6	22 9 0	24°5	
2 40 29 2	2	40	29	2	3 20 29 7	3	20	29	7	6 45 13 0	6	45	13	0	7 19 13 2	7	32 9 2	7	6 9 3	7	32 9 2	7	6 9 3	7	32 9 2	7	6 9 3	7	32 9 2	25°5	
3 57 30 2	3	57	30	2	4 32 30 11	4	32	30	11	7 48 13 5	7	48	13	5	8 16 13 8	8	38 9 5	8	10 9 7	8	38 9 5	8	10 9 7	8	38 9 5	8	10 9 7	8	38 9 5	26°5	
5 43 31 9	5	43	31	9	5 31 32 7	5	31	32	7	8 41 13 11	8	41	13	11	9 2 14 3	9	38 9 9	10	1 9 11	9	38 9 9	10	1 9 11	9	38 9 9	10	1 9 11	9	38 9 9	27°5	
Mean Spring } 18ft. 7in.					8ft. 0in.					5ft. 6in.																					
Low Spring } 18ft. 7in.					8ft. 0in.					5ft. 6in.																					

Equation of Time at Noon.

M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
3 34	Sub.	9	4 56	Sub.	17	5 51	Sub.	25	6 12	Sub.
3 45		10	5 5		18	5 56		26	6 12	
3 56		11	5 13		19	6 0		27	6 12	
4 7		12	5 20		20	6 3		28	6 11	
4 18		13	5 28		21	6 6		29	6 9	
4 28		14	5 34		22	6 9		30	6 7	
4 38		15	5 40		23	6 10		31	6 4	
4 47		16	5 46		24	6 12				

ms of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 13 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

JULY, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRAMIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
F.	1	9m54	8 37	8 7	9 2	8 9	5 47	6 9	6 12	6 10	3 8	9 6	3 31	4 16
S.	2	10 46	9 27	8 11	9 50	9 0	6 38	6 11	7 2	7 0	3 54	9 11	4 16	5 0
M.	3	11 37	10 12	9 0	10 32	9 1	7 25	7 0	7 47	7 1	4 38	10 3	5 0	5 40
Tu.	4	0 236	10 52	9 1	11 11	9 1	8 6	7 2	8 24	7 3	5 20	10 6	5 40	6 15
W.	5	1 13	11 30	9 1	11 45	9 1	8 42	7 3	8 56	7 2	6 0	10 7	6 15	6 50
Th.	6	1 58	—	—	0 2	9 1	9 13	7 1	9 29	7 0	6 32	10 5	6 50	7 24
F.	7	2 42	0 20	9 0	0 38	9 0	9 45	6 11	10 1	6 10	7 7	10 2	7 24	7 58
S.	8	3 24	0 56	9 0	1 14	8 11	10 17	6 9	10 35	6 7	7 41	9 10	7 58	8 35
M.	9	4 6	1 34	8 11	1 54	8 10	10 53	6 6	11 13	6 4	8 16	9 6	8 35	9 17
Tu.	10	4 48	2 15	8 9	2 36	8 8	11 37	6 2	—	—	8 55	9 1	9 17	10 10
W.	11	5 31	2 57	8 6	3 20	8 5	0 2	6 0	0 32	5 10	9 43	9 10	10 10	11 10
Th.	12	6 16	3 45	8 4	4 11	8 3	1 2	5 8	1 35	5 7	10 40	8 5	11 10	—
F.	13	7 3	4 39	8 2	5 10	8 1	2 11	5 7	2 47	5 7	11 42	8 4	—	0 48
S.	14	7 54	5 42	8 1	6 14	8 1	3 30	5 9	3 50	5 11	0 15	8 4	0 48	1 55
M.	15	8 49	6 48	8 1	7 22	8 2	4 19	6 2	4 46	6 4	1 21	8 7	1 55	2 54
Tu.	16	9 47	7 54	8 4	8 22	8 6	5 11	6 6	5 36	7 1	2 27	9 0	2 54	3 45
W.	17	10 46	8 50	8 9	9 17	9 0	6 1	6 11	6 27	7 1	3 21	9 9	3 45	4 31
Th.	18	11 46	9 42	9 2	10 6	9 4	6 53	7 4	7 18	7 6	4 8	10 7	4 31	5 21
F.	19	morn.	10 29	9 6	10 52	9 7	7 43	7 9	8 6	7 11	4 56	11 3	5 21	6 6
S.	20	0 45	11 14	9 8	11 36	9 9	8 28	8 1	8 48	8 2	5 45	11 9	6 6	6 52
M.	21	1 42	11 58	9 9	—	—	9 10	7 2	9 32	8 1	6 28	11 10	6 52	7 41
Tu.	22	2 37	0 22	9 9	0 47	9 9	9 54	7 11	10 16	7 9	7 17	11 7	7 41	8 27
W.	23	3 30	1 12	9 8	1 38	9 7	10 40	7 7	11 4	7 5	8 4	11 0	8 27	9 16
Th.	24	4 22	2 5	9 5	2 31	9 3	11 29	7 1	12 0	6 9	8 51	10 4	9 16	10 19
F.	25	5 14	2 57	9 1	3 24	8 10	—	—	0 33	6 5	9 46	9 7	10 19	11 27
S.	26	6 6	3 53	8 8	4 23	8 6	1 11	6 2	1 49	6 0	10 52	9 0	11 27	0 3
M.	27	6 58	4 56	8 4	5 30	8 3	2 29	5 11	3 7	5 11	—	—	0 3	1 15
Tu.	28	7 50	6 4	8 2	6 41	7 1	3 41	6 0	4 14	6 1	0 39	8 6	1 15	2 26
W.	29	8 42	7 18	8 1	7 53	8 2	4 44	6 2	5 12	6 3	1 51	8 7	2 26	3 20
Th.	30	9 33	8 22	8 3	8 49	8 5	5 36	6 5	6 0	6 6	2 54	8 11	3 20	4 4
F.	31	10 23	9 15	8 8	9 37	9 10	6 24	6 11	6 47	6 9	3 44	9 6	4 4	—

Half Mean Spring } 4^{ft.} 9^{in.}
Range.3^{ft.} 10^{in.}5^{ft.} 7^{in.}

Phases of the Moon.

	D.	H. M.	
New	4	0 24	Morning.
First Quarter	12	3 51	Morning.
Full	19	6 36	Morning.
Last Quarter	25	8 46	Afternoon.
In Apogee	8	8 0	Morning.
In Perigee	20	2 0	Afternoon.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	20	N. 3	9	0	N. 44	17	19	8.54	25	1	
2	20	17	10	3	8.22	18	1	17	26	1	
3	19	30	11	7	22	19	15	24	27	1	
4	17	49	12	11	9	20	11	28	28	1	
5	15	20	13	14	32	21	6	48	29	2	
6	12	14	14	17	20	22	1	47	30	1	
7	8	40	15	19	18	23	3	N. 15	31	1	
8	4	47	16	20	13	24	8	0			

Time of High Water are given for Mean Time at Place; if Dublin or Railway Time be required
 BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 4 m.

AUGUST, 1864.

DOVER.				SHEERNESS.				LONDON.				D. At Noon.
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	
10 14 16 9		10 36 17 1		—		0 5 14 9		1 13 17 0		1 36 17 3	28.5	
10 57 17 4		11 17 17 6		0 26 14 11		0 46 15 1		1 55 17 6		2 15 17 9	●	
11 36 17 8		11 54 17 10		1 6 15 3		1 23 15 5		2 34 18 0		2 52 18 3	0.9	
—		0 12 17 11		1 39 15 6		1 56 15 7		3 9 18 5		3 25 18 6	1.9	
0 28 18 0		0 44 18 0		2 11 15 7		2 26 15 7		3 40 18 7		3 56 18 8	2.9	
1 1 17 11		1 18 17 10		2 41 15 6		2 55 15 6		4 10 18 8		4 27 18 7	3.9	
1 35 17 9		1 51 17 7		3 10 15 5		3 25 15 3		4 42 18 6		4 58 18 4	4.9	
2 9 17 4		2 27 17 1		3 41 15 1		3 58 14 11		5 13 18 3		5 28 18 0	5.9	
2 45 16 9		3 4 16 5		4 16 14 8		4 33 14 5		5 46 17 10		6 5 17 7	6.9	
3 22 16 0		3 44 15 7		4 53 14 1		5 13 13 10		6 23 17 3		6 45 16 11	7.9	
4 9 15 2		4 34 14 9		5 37 13 6		6 5 13 3		7 7 16 7		7 34 16 4	8.9	
5 1 14 5		5 35 14 3		6 36 13 1		7 10 12 11		8 3 16 1		8 40 15 11	9.9	
6 11 14 4		6 49 14 8		7 52 13 0		8 34 13 1		9 21 15 10		9 39 15 9	10.9	
7 29 15 3		8 7 15 10		9 14 13 5		9 52 13 10		10 42 16 0		11 22 16 4	11.9	
8 39 16 6		9 9 17 3		10 28 14 3		10 58 14 9		11 57 16 —		—	12.9	
9 37 17 11		10 5 18 7		11 26 15 3		11 51 15 9		0 26 17 3		0 55 17 10	13.9	
10 32 19 2		10 57 19 8		—		0 16 16 2		1 21 18 4		1 46 18 11	○	
11 23 20 1		11 47 20 3		0 41 16 7		1 5 16 11		2 10 19 5		2 35 19 10	15.9	
—		0 12 20 5		1 27 17 2		1 50 17 3		2 58 20 2		3 19 20 5	16.9	
0 36 20 6		1 1 20 4		2 12 17 3		2 34 17 3		3 42 20 6		4 2 20 7	17.9	
1 25 20 1		1 49 19 8		2 55 17 2		3 16 16 11		4 23 — 6		4 48 20 3	18.9	
2 12 19 3		2 34 18 7		3 38 16 7		4 0 16 2		5 10 19 11		5 32 19 6	19.9	
2 56 17 11		3 18 17 3		4 22 15 9		4 44 15 2		5 54 19 9		6 17 18 6	20.9	
3 42 16 6		4 8 15 9		5 8 14 8		5 35 14 2		6 42 17 11		7 7 17 4	21.9	
4 34 15 0		5 3 14 6		6 4 13 8		6 37 13 3		7 34 16 9		8 5 16 3	22.9	
5 38 14 2		6 15 14 0		7 13 13 0		7 58 12 11		8 42 15 10		9 26 15 8	23.9	
6 54 14 2		7 34 14 5		8 38 12 11		9 19 13 10		10 6 15 6		10 45 15 7	24.9	
8 10 14 10		8 42 15 4		9 57 13 4		10 31 13 7		11 23 15 —		11 59 15 11	25.9	
9 8 15 9		9 33 16 3		11 13 11 11		11 27 14 3		—		0 28 16 4	26.9	
9 54 16 8		10 14 17 0		0 11 48 14 6		—		0 54 16 8		1 16 17 0	27.9	
10 33 17 4		10 50 17 8		0 7 14 10		0 25 15 1		1 36 17 5		1 53 17 9	28.9	
Mean Spring } Range.		9ft. 4in.		8ft. 0in.		9ft. 7in.						

Equation of Time at Noon.

M. S.	Sub.	M. S.	Sub.	M. S.	Sub.	M. S.	Sub.	M. S.	Sub.
6 1	Sub.	9 5 12	Sub.	17 3 46	Sub.	25 1 47	Sub.		
5 57		10 5 3		18 3 32		26 1 31			
5 52		11 4 54		19 3 19		27 1 14			
5 47		12 4 44		20 3 3		28 0 56			
5 41		13 4 33		21 2 50		29 0 38			
5 35		14 4 22		22 2 35		30 0 20			
5 28		15 4 11		23 2 19		31 0 2			
5 20		16 3 58		24 2 4					

1 of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, the
 10722 subtract 6 m. 1 22222222 subtract 3 m. 1 London 6 m.

AUGUST, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.							
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.					
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.				
M.	1	11-10	11 17	10 9	11 39	10 11	5 33	18 10	5 54	19 0	2 28	12 8	2 51	12 1				
Tu.	2	11 56	11 59	11 0	—	—	6 15	19 3	6 36	19 6	3 11	13 1	3 29	13				
W.	3	0 40	0 19	11 1	0 36	11 2	6 54	19 8	7 11	19 10	3 46	13 6	4 2	13				
Th.	4	1 22	0 52	11 2	1 8	11 3	7 27	20 0	7 44	20 0	4 18	13 9	4 34	13 1				
F.	5	2 4	1 25	11 2	1 41	11 2	8 0	20 1	8 14	20 1	4 49	13 10	5 4	13				
S.	6	2 46	1 55	11 1	2 11	11 0	8 29	20 0	8 45	19 10	5 19	13 8	5 35	13				
♄.	7	3 28	2 27	10 11	2 43	10 10	9 0	19 7	9 16	19 4	5 51	13 4	6 7	13				
M.	8	4 11	2 59	10 9	3 16	10 8	9 34	19 0	9 51	18 8	6 25	12 11	6 44	12				
Tu.	9	4 57	3 34	10 6	3 51	10 4	10 8	18 4	10 28	17 11	7 3	12 5	7 24	12				
W.	10	5 45	4 9	10 8	4 27	10 4	10 50	17 6	11 17	17 1	7 45	11 10	8 10	11				
Th.	11	6 37	4 51	9 11	5 17	9 9	11 48	16 8	—	—	8 37	11 3	9 8	11				
F.	12	7 31	5 45	9 8	6 17	9 7	0 21	16 4	0 54	16 2	9 41	10 11	10 22	10 1				
S.	13	8 29	6 59	9 8	7 42	9 9	1 31	16 2	2 9	16 3	11 1	10 11	11 39	11				
♄.	14	9 27	8 22	9 11	8 59	10 2	2 45	16 9	3 21	17 5	—	—	0 13	11				
M.	15	11 26	9 35	8 6	10 7	10 10	3 57	18 2	4 27	18 11	0 47	12 2	1 17	12				
Tu.	16	11 24	10 37	11 1	11 3	11 5	4 55	19 8	5 20	20 4	1 47	13 3	2 14	13				
W.	17	morn.	11 29	11 9	11 54	12 0	5 45	21 0	6 10	21 6	2 41	14 3	3 6	14				
Th.	18	0 21	—	—	0 18	12 2	6 35	22 0	6 58	22 5	3 28	15 1	3 50	15				
F.	19	1 17	0 40	12 3	1 2	12 4	7 21	22 7	7 44	22 9	4 12	15 8	4 34	15				
S.	20	2 12	1 25	12 4	1 48	12 3	8 7	22 9	8 29	22 7	4 56	15 9	5 18	15				
♄.	21	3 6	2 10	12 2	2 33	12 0	8 51	22 3	9 14	21 8	5 41	15 2	6 5	14 5				
M.	22	3 59	2 56	11 9	3 19	11 6	9 36	21 1	9 58	20 4	6 28	14 4	6 51	13 10				
Tu.	23	4 53	3 40	11 3	4 1	10 11	10 19	19 7	10 44	18 10	7 15	13 4	7 40	12 10				
W.	24	5 46	4 23	10 7	4 48	10 4	11 14	18 1	11 46	17 4	8 7	12 3	8 36	11 9				
Th.	25	6 39	5 16	10 0	5 46	9 10	—	—	0 22	16 8	9 8	11 3	9 45	10 11				
F.	26	7 30	6 21	9 8	7 5	9 7	0 58	16 3	1 35	16 0	10 26	10 9	11 5	10 8				
S.	27	8 20	7 47	9 7	8 27	9 8	2 13	15 11	2 49	16 2	11 43	10 10	—	—				
♄.	28	9 8	9 4	9 10	9 38	10 0	3 25	16 7	4 0	17 1	0 17	11 1	0 50	11 5				
M.	29	9 54	10 10	10 3	10 37	10 5	4 30	17 7	4 56	18 1	1 20	11 9	1 46	12 1				
Tu.	30	10 38	10 59	10 8	11 19	10 10	5 17	18 6	5 36	18 11	2 11	12 5	2 31	12 9				
W.	31	11 28	11 38	11 0	11 56	11 2	5 54	19 4	6 11	19 7	2 50	13 1	3 7	13 4				
Half Mean Spring } Range.			5 ft. 9 in.				10 ft. 5 in.				7 ft. 2 in.							
Phases of the Moon.							Moon's Declination at Noon.											
D. H. M.							M.D.	°	'	''	M.D.	°	'	''	M.D.	°	'	''
New - - - - -	2	2	34	Afternoon.	1	16	N. 4	9	13	8.18	17	8	57	25	19	N. 57		
First Quarter -	10	5	57	Afternoon.	2	13	10	10	16	14	18	3	59	26	19	43		
Full - - - - -	17	1	36	Afternoon.	3	9	46	11	18	28	19	1	N. 11	27	18	39		
Last Quarter -	24	6	4	Morning.	4	6	0	12	19	47	20	6	11	28	16	33		
							5	2	1	13	20	1	21	10	42	29	13	51
In Apogee - -	4	8	0	Afternoon.	♄	28	3	14	19	1	♄	14	28	30	10	37		
In Perigee - -	17	10	0	Afternoon.	7	6	3	15	16	44	23	17	20	31	6	59		
In Apogee - -	31	12	0	Midnight.	8	9	51	16	13	18	24	19	10					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

AUGUST, 1864.

NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	
2 32 11 6		2 52 11 9		1 27 14 5		1 49 14 9		7 40 11 8		7 58 12 0		28.5
3 11 12 0		3 30 12 3		2 9 15 0		2 28 15 3		8 16 12 3		8 33 12 5		●
3 47 12 5		4 3 12 6		2 45 15 5		3 0 15 7		8 48 12 6		9 4 12 7		0.9
4 19 12 7		4 36 12 7		3 15 15 8		3 31 15 7		9 20 12 7		9 36 12 7		1.9
4 51 12 7		5 7 12 6		3 47 15 7		4 1 15 6		9 51 12 6		10 7 12 4		2.9
5 23 12 5		5 39 12 3		4 17 15 5		4 34 15 3		10 24 12 3		10 40 12 0		3.9
5 55 12 2		6 11 12 0		4 50 15 1		5 6 14 11		10 56 11 10		11 15 11 7		4.9
6 29 11 10		6 47 11 7		5 23 14 9		5 43 14 6		11 35 11 3		11 54 11 0		5.9
7 5 11 4		7 26 11 1		6 1 14 2		6 22 13 10		— — — —		0 14 10 8		6.9
7 49 10 9		8 15 10 4		6 44 13 6		7 9 13 2		0 36 10 4		1 1 10 0		7.9
8 44 10 0		9 17 9 10		7 40 12 10		8 11 12 7		1 30 9 9		2 2 9 6		8.9
9 53 9 9		10 34 9 10		8 45 12 5		9 28 12 5		2 37 9 4		3 22 9 4		9.9
11 13 10 0		11 52 10 3		10 8 12 7		10 45 12 10		4 6 9 5		4 45 9 7		10.9
— — — —		0 27 10 8		11 20 13 3		11 54 13 9		5 22 9 11		5 55 10 5		11.9
0 59 11 1		1 28 11 6		— — — —		0 22 14 3		6 24 11 1		6 47 11 9		12.9
1 54 12 0		2 19 12 7		0 48 14 11		1 14 15 7		7 9 12 6		7 31 13 2		13.9
2 43 13 2		3 5 13 7		1 39 16 3		2 3 16 9		7 53 13 9		8 15 14 3		14.9
3 28 14 0		3 50 14 4		2 26 17 3		2 48 17 7		8 36 14 6		8 57 14 8		15.9
4 13 14 6		4 36 14 6		3 9 17 8		3 31 17 9		9 20 14 8		9 43 14 7		16.9
4 59 14 5		5 22 14 3		3 53 17 7		4 16 17 5		10 6 14 5		10 30 14 1		17.9
5 45 14 0		6 9 13 8		4 40 17 1		5 3 16 9		10 54 13 8		11 18 13 2		18.9
6 32 13 3		6 54 12 9		5 26 16 4		5 49 15 9		11 42 12 7		— — — —		19.9
7 17 12 3		7 43 11 9		6 13 15 2		6 39 14 7		0 6 12 0		0 31 11 5		20.9
8 12 11 1		8 43 10 6		7 6 13 11		7 38 13 4		0 58 10 10		1 28 10 3		21.9
9 18 10 1		9 57 9 10		8 12 12 10		8 49 12 6		2 3 9 9		2 41 9 5		22.9
10 38 9 8		11 17 9 9		9 33 12 4		10 12 12 3		3 28 9 3		4 10 9 1		23.9
11 56 9 10		— — — —		10 49 12 4		11 24 12 7		4 50 9 1		5 26 9 2		24.9
0 31 10 0		1 2 10 3		11 57 12 10		— — — —		5 58 9 6		6 27 10 0		25.9
1 31 10 7		1 55 10 11		0 25 13 3		0 49 13 8		6 49 10 5		7 9 10 11		26.9
2 16 11 3		2 35 11 8		1 10 14 1		1 30 14 7		7 25 11 5		7 40 11 10		27.9
2 52 12 0		3 8 12 3		1 48 14 11		2 5 15 3		7 55 12 3		8 9 12 6		28.9
Mean Spring } 6ft. 8in. Range.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
6 1	Sub.	9	5 12	Sub.	17	3 46	Sub.	25	1 47	Sub.
5 57		10	5 3		18	3 32		26	1 31	
5 52		11	4 54		19	3 19		27	1 14	
5 47		12	4 44		20	3 5		28	0 56	
5 41		13	4 33		21	2 50		29	0 38	
5 35		14	4 22		22	2 35		30	0 20	
5 28		15	4 11		23	2 19		31	0 2	
5 20		16	3 58		24	2 4				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for NORTH SHIELDS add 6 m. LEITH add 18 m. THURSO add 14 m.

AUGUST, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRAMIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTER.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
M.	1	11-10	11 11	8 11	11 33	9 0	10 27	23 5	10 47	23 9	5 14	18 7	5 37	
Tu.	2	11 56	11 54	9 8	—	—	11 7	24 1	11 25	24 5	5 59	19 3	6 17	
W.	3	0 40	0 13	8 1	0 31	9 4	11 43	24 8	11 59	24 10	6 33	19 10	6 49	
Th.	4	1 22	0 48	9 5	1 5	9 5	—	—	0 15	24 11	7 6	20 1	7 22	
F.	5	2 4	1 21	9 6	1 36	9 6	0 31	25 0	0 47	25 0	7 36	20 1	7 51	
S.	6	2 46	1 51	9 7	2 7	9 6	1 22	24 11	1 17	24 8	8 7	19 10	8 23	
▲	7	3 28	2 22	9 5	2 37	9 4	1 33	24 4	1 47	24 0	8 39	19 4	8 56	
M.	8	4 11	2 54	9 8	3 11	9 2	2 43	23 8	2 21	23 3	9 14	18 8	9 30	
Tu.	9	4 57	3 28	9 1	3 46	8 11	2 38	22 9	2 56	22 11	9 46	17 10	10 4	
W.	10	5 45	4 4	8 10	4 27	8 8	3 16	21 9	3 38	21 2	10 24	16 10	10 47	
Th.	11	6 37	4 52	8 7	5 20	8 5	4 5	20 7	4 36	20 11	10 15	15 10	11 36	
F.	12	7 31	5 51	8 3	6 20	8 2	5 10	19 10	5 52	19 10	—	—	0 10	
S.	13	8 29	7 8	8 1	7 48	8 3	6 37	20 1	7 18	20 7	0 49	15 5	1 34	
▲	14	9 27	8 27	8 6	9 4	8 9	7 55	21 8	8 31	22 2	2 18	16 11	2 58	
M.	15	10 26	9 37	8 11	10 7	9 2	9 12	23 2	9 27	24 1	3 33	18 1	4 5	
Tu.	16	11 24	10 34	9 5	11 2	9 8	9 52	25 1	10 17	26 0	4 35	19 11	5 5	
W.	17	morn.	11 29	9 10	11 54	10 0	10 42	26 8	11 6	27 4	5 33	21 6	5 58	
Th.	18	0 21	—	—	0 18	10 2	11 30	27 11	11 53	28 3	6 21	22 8	6 44	
F.	19	1 17	0 41	10 4	1 5	10 5	—	—	0 16	28 5	7 6	23 2	7 29	
S.	20	2 12	1 28	10 5	1 51	10 5	0 39	28 5	1 12	28 3	7 51	23 0	8 19	
▲	21	3 6	2 13	10 4	2 35	10 2	1 23	27 9	1 45	27 0	8 36	22 0	8 59	
M.	22	3 59	2 57	10 0	3 17	9 9	2 7	26 8	2 28	25 4	9 20	20 7	9 39	
Tu.	23	4 53	3 37	9 6	4 0	9 3	2 49	24 5	3 11	23 6	10 0	18 11	10 23	
W.	24	5 46	4 25	9 0	4 51	8 9	3 36	22 6	4 42	21 5	10 46	17 1	11 10	
Th.	25	6 39	5 21	8 6	5 54	8 4	4 36	20 6	5 13	20 0	11 39	15 6	—	
F.	26	7 30	6 33	8 2	7 13	8 0	5 58	19 8	6 42	19 7	0 15	15 2	0 55	
S.	27	8 20	7 53	8 1	8 32	8 2	7 23	19 10	8 0	20 2	1 40	15 1	2 23	
▲	28	9 8	9 7	8 4	9 40	8 6	8 34	20 9	9 42	21 5	3 1	15 11	3 35	
M.	29	9 54	10 6	8 11	10 30	8 9	9 29	22 0	9 50	22 8	4 4	17 2	4 30	
Tu.	30	10 38	10 51	8 11	11 11	9 0	10 9	23 8	10 27	23 9	4 53	18 4	5 14	
W.	31	11 21	11 30	8 2	11 47	9 3	10 44	24 2	11 0	24 6	5 34	19 3	5 52	

Half Mean Spring } 4^{ft.} 10^{in.}
Range.13^{ft.} 0^{in.}10^{ft.} 6^{in.}

Phases of the Moon.

	D.	H.	M.	
New	2	2	34	Afternoon.
First Quarter	10	5	57	Afternoon.
Full	17	1	36	Afternoon.
Last Quarter	24	6	4	Morning.
In Apogee	4	8	0	Afternoon.
In Perigee	17	10	0	Afternoon.
In Apogee	31	12	0	Midnight.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	16	N. 4	11	13	S. 18	17	8	S. 57	25	16	
2	13	10	10	16	14	18	3	59	26	16	
3	9	46	11	18	28	19	1	N. 11	27	16	
4	6	0	12	19	47	20	6	11	28	16	
5	2	1	13	20	1	21	10	42	29	1	
6	2	S. 3	14	19	1	22	14	28	30	1	
7	6	3	15	16	44	23	17	20	31		
8	9	51	16	13	18	24	19	10			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 GREENOCK add 10 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

AUGUST, 1864.

STON-SUPER-MARE.					HOLYHEAD.					KINGSTOWN.					C's Age at Noon.
EVENING.			AFTERNOON.		MORNING.			AFTERNOON.		MORNING.			AFTERNOON.		
e.	Height M. P. I.		Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.		Time. H. M. P. I.	Height. H. M. P. I.	Time. H. M. P. I.	Height. H. M. P. I.		Time. H. M. P. I.	Height. H. M. P. I.	
55	33	3	6 18	33 10	9 22	14 6		9 42	14 8	10 21	10 0		10 39	10 2	28.5
41	34	5	6 59	34 9	10 1	14 11		10 18	15 1	10 58	10 4		11 15	10 6	●
17	35	2	7 34	35 7	10 33	15 2		10 47	15 3	11 31	10 7		11 47	10 7	0.9
50	35	9	8 5	35 10	11 2	15 4		11 17	15 4	—	—		0 4	10 7	1.9
10	35	10	8 34	35 9	11 32	15 4		11 48	15 3	0 20	10 7		0 35	10 6	2.9
19	35	7	9 4	35 4	—	—		0 5	15 2	0 51	10 6		1 8	10 5	3.9
18	35	0	9 33	34 6	0 21	15 0		0 38	14 9	1 24	10 3		1 40	10 2	4.9
19	33	11	10 3	33 3	0 57	14 7		1 16	14 4	1 58	10 0		2 16	9 10	5.9
18	32	6	10 33	31 8	1 35	14 0		1 56	13 9	2 35	9 9		2 55	9 7	6.9
51	30	9	11 14	29 11	2 17	13 5		2 42	13 1	3 16	9 4		3 40	9 2	7.9
10	29	2	—	—	3 11	12 10		3 43	12 7	4 10	9 0		4 41	8 10	8.9
10	28	7	0 48	28 4	4 18	12 5		5 1	12 6	5 14	8 9		5 52	8 9	9.9
18	28	6	2 9	29 0	5 41	12 8		6 19	12 11	6 29	8 10		7 6	9 1	10.9
50	29	11	3 32	31 1	6 54	13 4		7 27	13 9	7 42	9 4		8 17	9 7	11.9
10	32	5	4 45	33 11	7 57	14 4		8 24	14 11	8 49	9 11		9 20	10 3	12.9
16	35	6	5 46	36 11	8 48	15 6		9 12	16 0	9 47	10 7		10 12	10 11	13.9
14	38	1	6 40	39 1	9 36	16 6		10 0	16 11	10 34	11 2		10 56	11 5	14.9
4	39	10	7 28	40 6	10 21	17 2		10 41	17 4	11 18	11 8		11 41	11 9	15.9
51	40	9	8 13	40 9	11 2	17 5		11 24	17 5	—	—		0 4	11 9	16.9
14	40	8	8 55	40 0	11 47	17 4		—	—	0 27	11 8		0 50	11 7	17.9
16	39	3	9 36	38 3	0 11	17 0		0 35	16 7	1 14	11 5		1 38	11 2	18.9
55	37	0	10 12	35 7	1 0	16 2		1 24	15 7	2 1	10 10		2 24	10 7	19.9
10	34	2	10 50	32 8	1 47	15 0		2 12	14 6	2 47	10 3		3 11	9 11	20.9
13	31	1	11 41	29 9	2 39	13 11		3 9	13 4	3 38	9 7		4 8	9 3	21.9
—	—	—	0 14	28 9	3 44	12 10		4 22	12 6	4 42	9 0		5 18	8 10	22.9
52	28	1	1 33	27 9	5 6	12 4		5 45	12 4	5 56	8 8		6 33	8 9	23.9
15	27	11	2 55	28 3	6 23	12 5		6 58	12 7	7 10	8 10		7 45	8 11	24.9
15	29	0	4 12	30 0	7 30	12 11		8 0	13 3	8 20	9 2		8 52	9 4	25.9
13	30	11	5 11	31 11	8 25	13 8		8 46	14 0	9 19	9 6		9 44	9 9	26.9
14	32	11	5 55	33 9	9 4	14 4		9 21	14 8	10 4	10 0		10 21	10 2	27.9
15	34	5	6 33	34 11	9 38	14 11		9 54	15 2	10 36	10 4		10 51	10 6	28.9
Spring }			18ft. 7in.		8ft. 0in.			5ft. 6in.							

Equation of Time at Noon.

S.		M. D.	M. S.		M. D.	M. S.		M. D.	M. S.	
I	Sub.	9	5 12	Sub.	17	3 46	Sub.	25	I 47	Sub.
57		10	5 3		18	3 32		26	I 31	
52		11	4 54		19	3 19		27	I 14	
47		12	4 44		20	3 5		28	0 56	
41		13	4 33		21	2 50		29	0 38	
35		14	4 22		22	2 35		30	0 20	
28		15	4 11		23	2 19		31	0 2	
20		16	3 58		24	2 4				

High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time

AUGUST, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.								
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.						
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.							
M.	1	11-10	9 58	8 11	10 18	9 0	7 10	6 11	7 31	7 0	4 24	10 1	4 24	10 1	4 24	10 1	4 24	10 1	4 24	10 1	4 24	10 1	4 24	10 1							
Tu.	2	11 56	10 37	9 1	10 54	9 2	7 51	7 1	8 8	7 3	5 4	10 5	5 4	10 5	5 4	10 5	5 4	10 5	5 4	10 5	5 4	10 5	5 4	10 5							
W.	3	02-40	11 10	9 2	11 25	9 2	8 23	7 4	8 38	7 4	5 39	10 8	5 39	10 8	5 39	10 8	5 39	10 8	5 39	10 8	5 39	10 8	5 39	10 8							
Th.	4	1 22	11 40	9 2	11 55	9 2	8 52	7 1	9 7	7 4	6 10	10 9	6 10	10 9	6 10	10 9	6 10	10 9	6 10	10 9	6 10	10 9	6 10	10 9							
F.	5	2 4	—	—	0 10	9 2	9 21	7 3	9 35	7 2	6 40	10 8	6 40	10 8	6 40	10 8	6 40	10 8	6 40	10 8	6 40	10 8	6 40	10 8							
S.	6	2 46	0 27	9 2	0 44	9 2	9 50	7 1	10 5	6 11	7 13	10 5	7 13	10 5	7 13	10 5	7 13	10 5	7 13	10 5	7 13	10 5	7 13	10 5							
M.	7	3 28	1 0	9 1	1 16	9 0	10 19	6 10	10 37	6 8	7 43	10 0	7 43	10 0	7 43	10 0	7 43	10 0	7 43	10 0	7 43	10 0	7 43	10 0							
Tu.	8	4 11	1 36	8 11	1 56	8 10	10 55	6 6	11 15	6 4	8 18	9 6	8 18	9 6	8 18	9 6	8 18	9 6	8 18	9 6	8 18	9 6	8 18	9 6							
W.	9	4 57	2 16	8 9	2 38	8 8	11 40	6 2	—	—	8 57	9 1	8 57	9 1	8 57	9 1	8 57	9 1	8 57	9 1	8 57	9 1	8 57	9 1							
Th.	10	5 45	3 0	8 6	3 24	8 4	0 6	5 11	0 38	5 8	9 48	8 7	9 48	8 7	9 48	8 7	9 48	8 7	9 48	8 7	9 48	8 7	9 48	8 7							
F.	11	6 37	3 52	8 3	4 23	8 2	1 13	5 7	1 51	5 6	10 52	8 3	1 51	5 6	10 52	8 3	1 51	5 6	10 52	8 3	1 51	5 6	10 52	8 3							
S.	12	7 31	4 55	8 1	5 33	8 0	2 30	5 6	3 11	5 8	—	—	3 11	5 8	—	—	3 11	5 8	—	—	3 11	5 8	—	—							
M.	13	8 29	6 11	8 0	6 50	8 1	3 48	5 10	4 22	0 1	0 45	8 4	4 22	0 1	0 45	8 4	4 22	0 1	0 45	8 4	4 22	0 1	0 45	8 4							
Tu.	14	9 27	7 27	7 2	8 2	8 5	4 51	6 4	5 18	6 7	2 0	8 10	5 18	6 7	2 0	8 10	5 18	6 7	2 0	8 10	5 18	6 7	2 0	8 10							
W.	15	10 26	8 31	8 1	8 58	9 0	5 43	6 10	6 8	7 2	3 2	9 1	6 8	7 2	3 2	9 1	6 8	7 2	3 2	9 1	6 8	7 2	3 2	9 1							
Th.	16	11 24	9 23	9 3	9 48	9 6	6 34	7 5	7 0	7 9	3 50	10 8	7 0	7 9	3 50	10 8	7 0	7 9	3 50	10 8	7 0	7 9	3 50	10 8							
F.	17	morn.	10 12	9 8	10 35	9 10	7 26	8 0	7 50	8 2	4 39	11 6	7 50	8 2	4 39	11 6	7 50	8 2	4 39	11 6	7 50	8 2	4 39	11 6							
S.	18	0 21	10 57	9 11	11 19	9 11	8 11	8 5	8 32	8 6	5 27	12 1	8 32	8 6	5 27	12 1	8 32	8 6	5 27	12 1	8 32	8 6	5 27	12 1							
M.	19	1 17	11 40	9 11	—	—	8 53	8 6	9 14	8 5	6 10	12 3	9 14	8 5	6 10	12 3	9 14	8 5	6 10	12 3	9 14	8 5	6 10	12 3							
Tu.	20	2 12	0 2	9 11	0 26	9 11	9 35	8 3	9 56	9 1	6 56	12 1	9 56	9 1	6 56	12 1	9 56	9 1	6 56	12 1	9 56	9 1	6 56	12 1							
W.	21	3 6	0 50	9 10	1 14	9 9	10 17	7 10	10 39	7 7	7 41	11 4	10 39	7 7	7 41	11 4	10 39	7 7	7 41	11 4	10 39	7 7	7 41	11 4							
Th.	22	3 59	1 38	9 7	2 2	9 4	11 2	7 3	11 27	6 11	8 25	10 6	11 27	6 11	8 25	10 6	11 27	6 11	8 25	10 6	11 27	6 11	8 25	10 6							
F.	23	4 53	2 27	9 1	2 54	8 10	11 58	6 6	—	—	9 14	9 7	—	—	9 14	9 7	—	—	9 14	9 7	—	—	9 14	9 7							
S.	24	5 46	3 21	8 8	3 51	8 5	0 33	6 1	1 11	5 10	10 17	8 9	1 11	5 10	10 17	8 9	1 11	5 10	10 17	8 9	1 11	5 10	10 17	8 9							
M.	25	6 39	4 23	8 3	4 59	8 1	1 53	5 8	2 34	5 7	11 31	8 3	2 34	5 7	11 31	8 3	2 34	5 7	11 31	8 3	2 34	5 7	11 31	8 3							
Tu.	26	7 30	5 37	8 0	6 15	7 11	3 15	5 7	3 51	5 9	0 10	8 2	3 51	5 9	0 10	8 2	3 51	5 9	0 10	8 2	3 51	5 9	0 10	8 2							
W.	27	8 20	6 55	7 11	7 32	7 11	4 25	5 11	4 55	6 0	1 28	7 2	4 55	6 0	1 28	7 2	4 55	6 0	1 28	7 2	4 55	6 0	1 28	7 2							
Th.	28	9 8	8 5	8 1	8 34	8 3	5 21	6 2	5 46	6 4	2 37	8 7	5 46	6 4	2 37	8 7	5 46	6 4	2 37	8 7	5 46	6 4	2 37	8 7							
F.	29	9 54	8 58	8 6	9 20	8 8	6 9	6 6	6 30	6 8	3 29	9 2	6 30	6 8	3 29	9 2	6 30	6 8	3 29	9 2	6 30	6 8	3 29	9 2							
S.	30	10 38	9 39	8 10	9 57	9 0	6 50	6 10	7 9	7 0	4 6	9 10	7 9	7 0	4 6	9 10	7 9	7 0	7 0	4 6	9 10	7 9	7 0	7 0							
M.	31	11 21	10 14	9 1	10 30	9 2	7 27	7 1	7 44	7 3	4 40	10 4	7 44	7 3	4 40	10 4	7 44	7 3	4 40	10 4	7 44	7 3	4 40	10 4							
Half Mean Spring Range.			4 ft. 9 in.								3 ft. 10 in.								5 ft. 7 in.												
Phases of the Moon.																Moon's Declination at Noon.															
D. H. M.																M.D. ° ' M.D. ° ' M.D. ° ' M.D. ° '															
New- - - - - 2 2 34 Afternoon.																1 16 N. 4 9 13 8. 18 17 8 s. 57 25															
First Quarter 10 5 57 Afternoon.																2 13 10 10 16 14 18 3 59 26															
Full - - - - - 17 1 36 Afternoon.																3 9 46 11 18 28 19 1 N. 11 27															
Last Quarter - 24 6 4 Morning.																4 6 0 12 19 47 20 6 11 28															
In Apogee - - 4 8 0 Afternoon.																5 2 1 13 20 1 21 10 42 29															
In Perigee - - 17 10 0 Afternoon.																6 2 s. 3 14 19 1 22 14 28 30															
In Apogee - - 31 12 0 Midnight.																7 6 3 15 16 44 23 17 20 31															
																8 9 51 16 13 18 24 19 10															

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required
 BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 8 m.

AUGUST, 1864.

MORNING.	GALWAY.				AFTERNOON.	QUEENSTOWN.				MORNING.	WATERFORD.				AFTERNOON.	C'S AGE AT NOON.				
	MORNING.					AFTERNOON.					MORNING.									
	Time.	Height.	Time.	Height.		Time.	Height.	Time.	Height.		Time.	Height.	Time.	Height.						
H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.				
3 44 12 11	4 4 13 2	4 5 10 6	4 27 10 8	4 25 11 3	4 48 11 5	28.5		4 24 13 5	4 41 13 8	4 47 10 11	5 5 11 1	5 10 11 7	5 28 11 8	5 28 11 8	5 28 11 8	28.5				
4 57 13 11	5 13 14 1	5 23 11 2	5 40 11 3	5 44 11 9	6 0 11 11	0.9		5 30 14 2	5 46 14 2	5 57 11 3	6 13 11 4	6 17 11 11	6 33 12 0	6 33 12 0	6 33 12 0	0.9				
6 1 14 1	6 17 14 0	6 28 11 4	6 43 11 3	6 49 12 0	7 5 12 0	2.9		6 33 13 11	6 49 13 9	6 59 11 2	7 15 11 1	7 20 12 0	7 36 11 11	7 36 11 11	7 36 11 11	2.9				
7 5 13 6	7 23 13 3	7 30 10 11	7 47 10 9	7 50 11 10	8 6 11 8	4.9		7 5 13 6	7 23 13 3	7 30 10 11	7 47 10 9	7 50 11 10	8 6 11 8	8 6 11 8	8 6 11 8	4.9				
7 42 13 0	8 1 12 8	8 4 10 7	8 19 10 4	8 22 11 6	8 38 11 4	5.9		7 42 13 0	8 1 12 8	8 4 10 7	8 19 10 4	8 22 11 6	8 38 11 4	8 38 11 4	8 38 11 4	5.9				
8 21 12 3	8 41 11 10	8 36 10 2	8 54 9 11	8 54 11 2	9 11 10 11	6.9		8 21 12 3	8 41 11 10	8 36 10 2	8 54 9 11	8 54 11 2	9 11 10 11	9 11 10 11	9 11 10 11	6.9				
9 5 11 5	9 31 11 1	9 16 9 8	9 39 9 5	9 30 10 8	9 55 10 5	7.9		9 5 11 5	9 31 11 1	9 16 9 8	9 39 9 5	9 30 10 8	9 55 10 5	9 55 10 5	9 55 10 5	7.9				
10 2 10 10	10 36 10 8	10 5 9 3	10 35 9 1	10 25 10 2	10 57 9 11	8.9		10 2 10 10	10 36 10 8	10 5 9 3	10 35 9 1	10 25 10 2	10 57 9 11	10 57 9 11	10 57 9 11	8.9				
11 16 10 8	11 57 10 10	11 14 9 0	11 54 9 1	11 33 9 10	— — — —	9.9		11 16 10 8	11 57 10 10	11 14 9 0	11 54 9 1	11 33 9 10	— — — —	— — — —	— — — —	9.9				
— — — —	0 36 11 2	— — — —	0 34 9 3	0 10 9 9	0 47 10 0	10.9		— — — —	0 36 11 2	— — — —	0 34 9 3	0 10 9 9	0 47 10 0	0 47 10 0	0 47 10 0	10.9				
1 12 11 7	1 45 12 2	1 14 9 6	1 54 9 10	1 24 10 3	2 3 10 7	11.9		1 12 11 7	1 45 12 2	1 14 9 6	1 54 9 10	1 24 10 3	2 3 10 7	2 3 10 7	2 3 10 7	11.9				
2 14 12 9	2 42 13 4	2 29 10 3	2 59 10 9	2 40 11 1	3 14 11 6	12.9		2 14 12 9	2 42 13 4	2 29 10 3	2 59 10 9	2 40 11 1	3 14 11 6	3 14 11 6	3 14 11 6	12.9				
3 9 14 0	3 34 14 7	3 28 11 2	3 56 11 8	3 45 11 11	4 15 12 5	13.9		3 9 14 0	3 34 14 7	3 28 11 2	3 56 11 8	3 45 11 11	4 15 12 5	4 15 12 5	4 15 12 5	13.9				
3 59 15 1	4 23 15 8	4 22 12 0	4 46 12 4	4 44 12 9	5 9 13 0	14.9		3 59 15 1	4 23 15 8	4 22 12 0	4 46 12 4	4 44 12 9	5 9 13 0	5 9 13 0	5 9 13 0	14.9				
4 45 16 1	5 7 16 4	5 10 12 7	5 34 12 9	5 32 13 3	5 55 13 5	15.9		4 45 16 1	5 7 16 4	5 10 12 7	5 34 12 9	5 32 13 3	5 55 13 5	5 55 13 5	5 55 13 5	15.9				
5 30 16 5	5 54 16 5	5 57 12 10	6 20 12 10	6 18 13 6	6 41 13 6	16.9		5 30 16 5	5 54 16 5	5 57 12 10	6 20 12 10	6 18 13 6	6 41 13 6	6 41 13 6	6 41 13 6	16.9				
6 17 16 3	6 40 15 11	6 43 12 9	7 5 12 6	7 4 13 6	7 26 13 4	17.9		6 17 16 3	6 40 15 11	6 43 12 9	7 5 12 6	7 4 13 6	7 26 13 4	7 26 13 4	7 26 13 4	17.9				
7 3 15 6	7 26 15 0	7 28 12 3	7 50 11 11	7 48 13 1	8 9 12 10	18.9		7 3 15 6	7 26 15 0	7 28 12 3	7 50 11 11	7 48 13 1	8 9 12 10	8 9 12 10	8 9 12 10	18.9				
7 49 14 5	8 11 13 9	8 10 11 6	8 29 11 1	8 29 12 6	8 48 12 1	19.9		7 49 14 5	8 11 13 9	8 10 11 6	8 29 11 1	8 29 12 6	8 48 12 1	8 48 12 1	8 48 12 1	19.9				
8 36 13 0	9 3 12 4	8 50 10 8	9 14 10 3	9 8 11 8	9 29 11 3	20.9		8 36 13 0	9 3 12 4	8 50 10 8	9 14 10 3	9 8 11 8	9 29 11 3	9 29 11 3	9 29 11 3	20.9				
9 31 11 7	10 2 11 1	9 38 9 9	10 5 9 4	9 54 10 9	10 25 10 4	21.9		9 31 11 7	10 2 11 1	9 38 9 9	10 5 9 4	9 54 10 9	10 25 10 4	10 25 10 4	10 25 10 4	21.9				
10 39 10 9	11 21 10 7	10 38 9 1	11 18 8 11	11 0 9 11	11 37 9 8	22.9		10 39 10 9	11 21 10 7	10 38 9 1	11 18 8 11	11 0 9 11	11 37 9 8	11 37 9 8	11 37 9 8	22.9				
— — — —	0 1 10 6	11 59 8 10	— — — —	— — — —	0 14 9 6	23.9		— — — —	0 1 10 6	11 59 8 10	— — — —	— — — —	— — — —	— — — —	— — — —	23.9				
0 40 10 7	1 16 10 10	0 39 8 11	1 19 9 0	0 51 9 8	1 29 9 9	24.9		0 40 10 7	1 16 10 10	0 39 8 11	1 19 9 0	0 51 9 8	1 29 9 9	1 29 9 9	1 29 9 9	24.9				
1 48 11 2	2 17 11 7	1 57 9 3	2 31 9 6	2 6 10 0	2 42 10 4	25.9		1 48 11 2	2 17 11 7	1 57 9 3	2 31 9 6	2 6 10 0	2 42 10 4	2 42 10 4	2 42 10 4	25.9				
2 43 12 0	3 6 12 5	2 58 9 9	3 24 10 1	3 13 10 7	3 40 10 10	26.9		2 43 12 0	3 6 12 5	2 58 9 9	3 24 10 1	3 13 10 7	3 40 10 10	3 40 10 10	3 40 10 10	26.9				
3 26 12 9	3 43 13 2	3 45 10 5	4 5 10 8	4 3 11 2	4 24 11 5	27.9		3 26 12 9	3 43 13 2	3 45 10 5	4 5 10 8	4 3 11 2	4 24 11 5	4 24 11 5	4 24 11 5	27.9				
4 0 13 5	4 16 13 9	4 23 10 11	4 40 11 1	4 45 11 7	5 3 11 9	28.9		4 0 13 5	4 16 13 9	4 23 10 11	4 40 11 1	4 45 11 7	5 3 11 9	5 3 11 9	5 3 11 9	28.9				
If Mean Spring } 7ft. 5in. Range.																				
5ft. 10in.																				
6ft. 2in.																				

Equation of Time at Noon.

M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
6 1	Sub.	9	5 12	Sub.	17	3 46	Sub.	25	1 47	Sub.
5 57		10	5 3		18	3 32		26	1 31	
5 52		11	4 54		19	3 19		27	1 14	
5 47		12	4 44		20	3 5		28	0 56	
5 41		13	4 33		21	2 50		29	0 38	
5 35		14	4 22		22	2 35		30	0 20	
5 28		15	4 11		23	2 19		31	0 2	
5 20		16	3 58		24	2 4				

es of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

SEPTEMBER, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
Th.	1	0 23	3 41	18 2	3 56	18 4	5 36	14 6	5 52	15 2	11 37	12 2	11 52	12	
F.	2	0 45	4 12	18 6	4 26	18 7	6 8	14 9	6 24	15 3	—	—	0 8	12	
S.	3	1 27	4 42	18 7	4 57	18 7	6 39	14 11	6 54	15 2	0 23	12 5	0 40	12	
▲	4	2 10	5 13	18 5	5 27	18 3	7 7	14 9	7 20	14 10	0 57	12 4	1 12	12	
M.	5	2 55	5 41	18 0	5 57	17 9	7 34	14 6	7 48	14 4	1 27	12 3	1 42	12	
Tu.	6	3 42	6 14	17 5	6 32	16 10	8 4	14 1	8 21	13 10	1 57	12 0	2 14	11 1	
W.	7	4 31	6 49	16 4	7 11	15 8	8 37	13 7	8 54	13 3	2 32	11 7	2 50	11	
Th.	8	5 23	7 34	15 1	7 57	14 6	9 14	13 1	9 37	12 7	3 11	11 2	3 32	10 1	
F.	9	6 17	8 27	14 0	9 1	13 7	10 1	12 8	10 31	12 1	3 55	10 7	4 24	10	
S.	10	7 13	9 40	13 6	10 24	13 8	11 3	12 4	11 43	11 10	4 56	10 1	5 33	9 1	
▲	11	8 10	11 11	14 0	11 54	14 7	—	—	0 29	12 6	6 15	9 11	7 0	10	
M.	12	9 7	—	—	0 31	15 4	1 14	12 4	1 59	13 3	7 41	10 6	8 21	11	
Tu.	13	10 3	1 6	16 4	1 36	17 4	2 37	13 4	3 14	14 6	8 57	11 6	9 28	12	
W.	14	10 59	2 1	18 4	2 24	19 3	3 47	14 5	4 14	15 6	9 56	12 5	10 20	12 10	
Th.	15	11 55	2 46	20 1	3 9	20 9	4 40	15 4	5 5	16 4	10 43	13 2	11 5	13	
F.	16	morn.	3 31	21 2	3 54	21 4	5 29	16 2	5 54	16 10	11 27	13 8	11 50	13 11	
S.	17	0 50	4 17	21 5	4 39	21 4	6 18	16 7	6 41	16 11	—	—	0 14	13 16	
▲	18	1 46	5 0	21 1	5 22	20 7	7 1	16 6	7 22	16 5	0 38	13 9	1 1	13 17	
M.	19	2 41	5 43	20 0	6 3	19 4	7 42	16 1	8 3	15 9	1 23	13 4	1 44	13 17	
Tu.	20	3 37	6 24	18 6	6 46	17 7	8 22	15 4	8 40	14 10	2 4	12 9	2 25	12 5	
W.	21	4 31	7 10	16 7	7 35	15 7	8 59	14 5	9 20	13 8	2 46	12 0	3 9	11 17	
Th.	22	5 24	8 1	14 9	8 29	13 11	9 42	13 5	10 4	12 7	3 33	11 2	3 58	10 9	
F.	23	6 16	9 0	13 4	9 42	13 0	10 32	12 6	11 2	11 8	4 24	10 3	4 55	9 11	
S.	24	7 4	10 26	12 11	11 9	12 11	11 41	12 0	—	—	5 35	9 8	6 16	9 6	
▲	25	7 51	11 49	13 3	—	—	0 23	11 6	1 5	12 3	6 58	9 7	7 36	9 10	
M.	26	8 36	0 25	13 8	0 56	14 3	1 45	11 10	2 20	12 10	8 13	10 1	8 47	10 5	
Tu.	27	9 19	1 23	14 11	1 45	15 6	2 51	12 7	3 21	13 7	9 15	10 9	9 37	11 17	
W.	28	10 2	2 4	16 2	2 22	16 9	3 44	13 4	4 6	14 3	9 59	11 4	10 17	11 17	
Th.	29	10 44	2 38	17 3	2 54	17 9	4 27	14 0	4 47	14 9	10 34	11 10	10 50	12 4	
F.	30	11 26	3 10	18 2	3 26	18 5	5 5	14 7	5 21	15 3	11 6	12 2	11 22	12 4	
Half Mean Spring } Range.			9 ^{ft.} 6 ^{in.}				7 ^{ft.} 9 ^{in.}				6 ^{ft.} 4 ^{in.}				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'
New	—	—	1	6	8	Morning.	1	3	N. 5	9	19	S. 50	17	8	N. 45
First Quarter	—	—	9	5	50	Morning.	2	0	S. 56	10	19	19	18	12	56
Full	—	—	15	9	9	Afternoon.	3	4	56	11	17	36	19	16	13
Last Quarter	—	—	22	6	54	Afternoon.	4	8	46	12	14	45	20	18	28
New	—	—	30	10	43	Afternoon.	5	12	17	13	10	54	21	19	36
In Perigee	—	—	15	8	0	Morning.	6	15	19	14	6	16	22	19	40
In Apogee	—	—	28	5	0	Morning.	7	17	42	15	1	12	23	18	44
							8	19	16	16	3	N. 55	24	16	57

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4 m.

SEPTEMBER, 1864.

DOVER.				SHEERNESS.				LONDON.				C's Age at Noon.
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
Time. H. M. P. L.	Height. H. M. P. L.	Time. H. M. P. L.	Height. H. M. P. L.	Time. H. M. P. L.	Height. H. M. P. L.	Time. H. M. P. L.	Height. H. M. P. L.	Time. H. M. P. L.	Height. H. M. P. L.	Time. H. M. P. L.	Height. H. M. P. L.	
11 7 17 10	11 24 18 0	0 42 15 4	0 59 15 6	2 10 18 0	2 26 18 3	●						
11 41 18 2	11 57 18 1	1 14 15 8	1 28 15 9	2 44 18 6	2 59 18 8	1.2						
— — — —	0 14 18 3	1 44 15 10	1 58 15 10	3 13 18 9	3 28 18 11	2.2						
0 31 18 4	0 48 18 1	2 13 15 10	2 28 15 9	3 43 18 11	3 57 18 11	3.2						
1 4 18 2	1 20 18 0	2 43 15 8	2 57 15 7	4 14 18 10	4 28 18 9	4.2						
1 37 17 9	1 54 17 6	3 11 15 5	3 26 15 3	4 43 18 7	4 59 18 5	5.2						
2 13 17 2	2 32 16 9	3 43 15 0	4 2 14 9	5 15 18 2	5 32 17 10	6.2						
2 52 16 4	3 13 15 11	4 20 14 5	4 42 14 1	5 52 17 7	6 12 17 2	7.2						
3 36 15 5	4 4 14 11	5 4 13 9	5 30 13 6	6 35 16 10	7 1 16 6	8.2						
4 34 14 6	5 8 14 3	6 2 13 2	6 39 12 11	7 31 16 2	8 6 15 11	9.2						
5 45 14 4	6 26 14 8	7 21 12 11	8 6 13 1	8 49 15 10	9 32 15 10	10.2						
7 7 15 2	7 46 15 11	8 51 13 5	9 31 13 10	10 16 16 0	10 58 16 4	11.2						
8 21 16 8	8 51 17 5	10 8 14 4	10 40 14 10	11 35 16 9	— — — —	12.2						
9 19 18 2	9 44 18 10	11 10 15 5	11 34 15 10	0 6 17 4	0 35 17 11	13.2						
10 8 19 5	10 33 19 11	11 57 16 4	— — — —	1 3 18 6	1 27 19 1	14.2						
10 58 20 1	11 23 20 1	0 19 16 9	0 42 17 1	1 48 19 7	2 11 20 0	15.2						
11 47 20 7	— — — —	1 4 17 4	1 26 17 5	2 34 20 4	2 56 20 7	16.2						
0 11 20 6	0 35 20 4	1 48 17 5	2 10 17 4	3 19 20 8	3 41 20 7	17.2						
0 59 20 0	1 22 19 7	2 32 17 2	2 52 16 11	4 22 20 5	4 43 20 2	18.2						
1 44 19 1	2 6 18 6	3 13 16 6	3 33 16 1	4 43 19 10	5 4 19 5	19.2						
2 28 17 10	2 51 17 0	3 54 15 8	4 16 15 2	5 25 18 11	5 46 18 4	20.2						
3 14 16 3	3 39 15 7	4 40 14 7	5 5 14 2	6 10 17 9	6 35 17 2	21.2						
4 4 14 11	4 32 14 3	5 34 13 7	6 3 13 2	7 1 16 8	7 33 16 2	22.2						
5 8 13 10	5 46 13 8	6 39 12 9	7 23 12 8	8 8 15 9	8 51 15 6	23.2						
6 27 13 9	7 3 14 1	8 7 12 7	8 49 12 9	9 32 15 4	10 12 15 4	24.2						
7 39 14 6	8 12 15 0	9 27 13 1	10 2 13 4	10 53 15 6	11 28 15 9	25.2						
8 38 15 6	9 0 15 11	10 32 13 8	10 57 14 0	12 0 16 1	— — — —	26.2						
9 22 16 5	9 41 16 10	11 19 14 4	11 37 14 8	0 24 16 5	0 44 16 10	27.2						
9 59 17 1	10 17 17 7	11 54 15 0	— — — —	1 5 17 2	1 24 17 6	28.2						
10 34 17 10	10 52 18 1	0 10 15 3	0 27 15 5	1 42 17 10	1 57 18 2	29.2						
Mean Spring } 9ft. 4in.				8ft. 0in.				9ft. 7in.				
Range.												

Equation of Time at Noon.

M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
0 17		9	2 55		17	5 44		25	8 31	
0 36		10	3 16		18	6 5		26	8 51	
0 55		11	3 37		19	6 26		27	9 11	
1 14		12	3 58		20	6 47		28	9 31	
1 34		13	4 19		21	7 8		29	9 51	
1 54		14	4 40		22	7 29		30	10 10	
2 14		15	5 1		23	7 50				
2 35		16	5 22		24	8 11				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 Dover subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

SEPTEMBER, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.
Th.	1	08 3	—	—	0 12	11 3	6 29	19 10	6 45	20 0	3 22	13 6	3 37	1
F.	2	0 45	0 27	11 4	0 41	11 4	7 0	20 3	7 15	20 4	3 52	13 11	4 6	1
S.	3	1 27	0 56	11 5	1 11	11 4	7 30	20 5	7 46	20 5	4 21	14 2	4 36	1
♄.	4	2 10	1 27	11 4	1 42	11 3	8 1	20 5	8 16	20 4	4 51	14 1	5 6	1
M.	5	2 55	1 58	11 2	2 13	11 1	8 31	20 2	8 46	19 11	5 21	13 9	5 37	1
Tu.	6	3 42	2 28	11 0	2 44	10 10	9 2	19 7	9 19	19 3	5 53	13 4	6 11	1
W.	7	4 31	3 1	10 9	3 19	10 7	9 37	18 9	9 55	18 4	6 30	12 9	6 50	1
Th.	8	5 23	3 37	10 5	3 57	10 2	10 18	17 10	10 41	17 5	7 13	12 1	7 36	1
F.	9	6 17	4 18	10 0	4 43	9 10	11 10	16 11	11 46	16 6	8 2	11 5	8 34	1
S.	10	7 13	5 13	9 8	5 47	9 7	—	—	0 24	16 2	9 10	10 11	9 52	1
♄.	11	8 10	6 27	9 7	7 14	9 9	1 3	16 1	1 42	16 3	10 34	10 11	11 16	1
M.	12	9 7	7 59	9 11	8 38	10 2	2 23	16 8	3 0	17 4	11 53	11 7	—	—
Tu.	13	10 3	9 15	10 6	9 49	10 10	3 36	18 2	4 9	19 1	0 27	12 2	0 59	1
W.	14	10 59	10 20	11 3	10 45	11 7	4 39	19 11	5 2	20 7	1 29	13 5	1 57	1
Th.	15	11 55	11 9	11 10	11 32	12 2	5 25	21 3	5 48	21 10	2 21	14 5	2 44	1
F.	16	morn.	11 55	12 4	—	—	6 12	22 4	6 35	22 8	3 5	15 3	3 27	1
S.	17	0 50	0 17	12 5	0 39	12 6	6 58	22 10	7 21	23 0	3 49	15 10	4 11	1
♄.	18	1 46	1 2	12 5	1 25	12 4	7 44	22 10	8 5	22 7	4 33	15 10	4 55	1
M.	19	2 41	1 46	12 2	2 8	12 0	8 26	22 2	8 48	21 8	5 17	15 3	5 39	1
Tu.	20	3 37	2 30	11 9	2 51	11 6	9 9	21 0	9 30	20 3	6 0	14 3	6 21	1
W.	21	4 31	3 12	11 2	3 33	10 10	9 51	19 6	10 16	18 7	6 46	13 3	7 12	1
Th.	22	5 24	3 56	10 6	4 19	10 2	10 42	17 10	11 14	17 2	7 37	12 1	8 6	1
F.	23	6 16	4 46	9 11	5 14	9 8	11 48	16 6	—	—	8 35	11 1	9 10	1
S.	24	7 4	5 46	9 6	6 29	9 5	0 24	15 11	1 4	15 7	9 54	10 6	10 35	1
♄.	25	7 51	7 15	9 5	7 57	9 6	1 43	15 6	2 22	15 9	11 15	10 6	11 49	1
M.	26	8 36	8 34	9 8	9 9	9 10	2 56	16 2	3 30	16 8	—	—	0 21	1
Tu.	27	9 19	9 39	10 1	10 6	10 4	4 1	17 3	4 26	17 10	0 51	11 6	1 16	1
W.	28	10 2	10 29	10 6	10 48	10 9	4 48	18 3	5 6	18 9	1 38	12 3	2 0	1
Th.	29	10 44	11 6	10 11	11 23	11 1	5 23	19 2	5 39	19 6	2 18	12 11	2 35	1
F.	30	11 26	11 40	11 3	11 56	11 4	5 56	19 10	6 13	20 1	2 52	13 5	3 7	1

Half Mean Spring }
Range

5 ft. 9 in.

10 ft. 5 in.

7 ft. 2 in.

Phases of the Moon.

	D.	H.	M.	
New	1	6	8	Morning.
First Quarter	9	5	50	Morning.
Full	15	9	9	Afternoon.
Last Quarter	22	6	54	Afternoon.
New	30	10	43	Afternoon.
In Perigee	15	8	0	Morning.
In Apogee	28	5	0	Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	3	N. 5	9	19	S. 50	17	8	N. 45	25	1	
2	0	S. 56	10	19	19	18	12	56	26	1	
3	4	56	11	17	36	19	16	13	27		
4	8	46	12	14	45	20	18	28	28		
5	12	17	13	10	54	21	19	36	29		
6	15	19	14	6	16	22	19	40	30		
7	17	42	15	1	12	23	18	44			
8	19	16	16	3	N. 55	24	16	57			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

SEPTEMBER, 1864.

NORTH SHIELDS.								LEITH.								THURSO.								C's AGE AT NOON.
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.					
H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	D.				
3 23 12 5		3 37 12 8		2 21 15 6		2 36 15 9		8 24 12 9		8 38 12 10										●				
3 52 12 9		4 7 12 10		2 50 15 10		3 3 15 11		8 52 12 11		9 6 12 11										1·2				
4 22 12 11		4 38 12 10		3 17 15 11		3 32 15 11		9 22 12 10		9 38 12 9										2·2				
4 54 12 9		5 10 12 8		3 48 15 9		4 4 15 8		9 54 12 8		10 9 12 6										3·2				
5 25 12 6		5 40 12 4		4 19 15 6		4 35 15 4		10 25 12 3		10 42 12 0										4·2				
5 57 12 2		6 14 11 11		4 51 15 2		5 8 14 11		11 0 11 9		11 20 11 4										5·2				
6 33 11 8		6 52 11 4		5 28 14 7		5 48 14 3		11 40 11 0		—										6·2				
7 15 11 0		7 40 10 8		6 11 13 9		6 35 13 5		0 3 10 7		0 27 10 3										7·2				
8 8 10 3		8 42 9 11		7 2 13 0		7 37 12 8		0 53 9 11		1 27 9 8										8·2				
9 21 9 9		10 4 9 9		8 14 12 5		8 57 12 4		2 5 9 5		2 49 9 4										9·2				
10 47 9 11		11 29 10 3		9 41 12 6		10 22 12 10		3 37 9 5		4 22 9 7										10·2				
—		0 7 10 8		11 0 13 3		11 34 13 9		5 1 9 11		5 36 10 5										11·2				
10 40 11 1		1 11 11 8		—		0 5 14 5		6 7 11 1		6 32 11 10										12·2				
11 38 12 2		2 2 12 9		0 32 15 1		0 56 15 9		6 54 12 7		7 13 13 4										13·2				
12 24 13 4		2 45 13 10		1 20 16 5		1 42 17 0		7 32 13 11		7 52 14 5										14·2				
1 6 14 3		3 27 14 6		2 4 17 5		2 26 17 9		8 13 14 9		8 34 14 10										15·2				
1 49 14 8		4 12 14 9		2 46 17 11		3 8 17 11		8 57 14 11		9 20 14 9										16·2				
1 35 14 7		4 58 14 3		3 30 17 9		3 52 17 6		9 42 14 6		10 5 14 11										17·2				
1 20 13 11		5 43 13 7		4 14 17 1		4 37 16 8		10 27 13 7		10 49 13 11										18·2				
1 4 13 2		6 25 12 8		4 58 16 3		5 20 15 8		11 11 12 6		11 36 11 11										19·2				
1 48 12 2		7 13 11 7		5 44 15 1		6 10 14 5		—		0 1 11 3										20·2				
1 41 11 0		8 12 10 4		6 36 13 9		7 6 13 2		0 28 10 7		0 58 10 1										21·2				
1 44 9 11		9 22 9 7		7 38 12 8		8 14 12 3		1 29 9 7		2 6 9 2										22·2				
1 6 9 5		10 47 9 5		8 59 12 0		9 42 12 0		2 52 9 0		3 39 8 10										23·2				
1 27 9 7		—		10 21 12 1		10 56 12 4		4 20 8 10		4 57 9 0										24·2				
1 3 9 10		0 35 10 1		11 28 12 7		11 58 12 11		5 30 9 3		5 59 9 8										25·2				
1 3 10 4		1 27 10 9		—		0 21 13 5		6 23 10 2		6 41 10 8										26·2				
1 47 11 1		2 5 11 5		0 41 13 10		0 59 14 3		6 58 11 1		7 13 11 6										27·2				
1 22 11 9		2 37 12 1		1 17 14 8		1 34 15 1		7 26 12 0		7 40 12 4										28·2				
1 53 12 4		3 7 12 7		1 50 15 5		2 5 15 8		7 54 12 8		8 9 12 11										●				
In Spring } 6ft. 8in.				8ft. 2in.				6ft. 7in.																

Equation of Time at Noon.

S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
17		9	2 55		17	5 44		25	8 31	
36		10	3 16		18	6 5		26	8 51	
55		11	3 37		19	6 26		27	9 11	
14		12	3 58		20	6 47		28	9 31	
34		13	4 19		21	7 8		29	9 51	
54		14	4 40		22	7 29		30	10 10	
14		15	5 1		23	7 50				
35		16	5 22		24	8 11				

f High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

SEPTEMBER, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
		H. M.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.
Th.	1	0 8 3	—	—	0 4 9	4	11 16 24	10	11 32 25	1	6 8 19	11	6 23 20	2
F.	2	0 45	0 20	9 5	0 35 9	6	11 47 25	4	—	—	6 38 20	5	6 53 20	6
S.	3	1 27	0 50	9 7	1 6 9	7	0 2 25	5	0 18 25	6	7 8 20	7	7 23 20	6
M.	4	2 10	1 23	9 7	1 39 9	7	0 34 25	5	0 49 25	4	7 39 20	4	7 53 20	5
Tu.	5	2 55	1 53	9 7	2 7 9	6	1 4 25	2	1 18 24	10	8 8 19	11	8 24 19	8
W.	6	3 42	2 23	9 5	2 39 9	4	1 33 24	5	1 49 23	11	8 41 19	3	8 59 18	9
Th.	7	4 31	2 56	9 2	3 14 9	1	2 7 23	4	2 25 22	10	9 16 18	3	9 35 17	10
F.	8	5 23	3 35	8 11	3 56 8	9	2 45 22	2	3 7 21	7	9 54 17	3	10 16 16	11
S.	9	6 17	4 19	8 8	4 48 8	6	3 31 21	0	4 2 20	5	10 42 16	1	11 10 15	12
M.	10	7 13	5 21	8 4	5 59 8	3	4 38 19	11	5 21 19	9	11 44 15	4	—	—
Tu.	11	8 10	6 41	8 2	7 25 8	3	6 7 20	0	6 55 20	6	0 22 15	5	1 9 15	9
W.	12	9 7	8 6	8 6	8 43 8	9	7 34 21	3	8 12 22	2	1 55 16	4	2 36 17	10
Th.	13	10 3	9 19	9 0	9 49 9	3	8 43 23	3	9 12 24	4	3 14 18	2	3 47 19	11
F.	14	10 59	10 16	9 6	10 41 9	9	9 36 25	4	9 58 26	4	4 16 20	2	4 44 21	12
S.	15	11 55	11 6	9 11	11 30 10	1	10 20 27	1	10 43 27	8	5 10 21	10	5 35 22	1
M.	16	morn.	11 54	10 3	—	—	11 6 28	3	11 29 28	6	5 58 22	11	6 21 23	2
Tu.	17	0 50	0 17	10 5	0 41 10	6	11 52 28	8	—	—	6 44 23	5	7 6 23	3
W.	18	1 46	1 5	10 5	1 27 10	4	0 15 28	7	0 38 28	3	7 27 22	11	7 49 22	4
Th.	19	2 41	1 48	10 3	2 9 10	1	0 59 27	9	1 20 27	0	8 11 21	11	8 31 21	5
F.	20	3 37	2 30	9 11	2 50 9	8	1 39 26	2	2 0 25	3	8 52 20	6	9 12 19	6
S.	21	4 31	3 10	9 5	3 33 9	2	2 21 24	3	2 43 23	2	9 33 18	7	9 55 17	7
M.	22	5 24	3 57	8 11	4 23 8	9	3 8 22	2	3 34 21	2	10 18 16	11	10 42 16	8
Tu.	23	6 16	4 50	8 6	5 20 8	3	4 3 20	4	4 38 19	7	11 8 15	3	11 44 14	9
W.	24	7 4	6 0	8 0	6 42 7	11	5 23 19	3	6 9 19	2	—	—	0 23 14	7
Th.	25	7 51	7 23	7 11	8 1 8	0	6 53 19	4	7 30 19	9	1 7 14	8	1 50 15	0
F.	26	8 36	8 37	8 2	9 9 8	4	8 5 20	3	8 35 20	11	2 28 15	5	3 3 16	1
S.	27	9 19	9 36	8 7	9 58 8	9	9 0 21	8	9 21 22	4	3 32 16	10	3 56 17	2
M.	28	10 2	10 19	8 10	10 38 9	0	9 39 22	11	9 56 23	6	4 19 18	0	4 40 18	3
Tu.	29	10 44	10 56	9 2	11 14 9	3	10 11 24	0	10 28 24	5	4 59 19	1	5 18 19	4
W.	30	11 26	11 31	9 4	11 48 9	5	10 45 24	10	11 1 25	1	5 36 19	11	5 53 20	5

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
New	—	—	—	Morning.	1	3	N. 5	9	19	8.50	17	8	N. 45	25	14	N. 27
First Quarter	9	5	50	Morning.	2	0	8.56	10	19	19	18	12	56	26	13	22
Full	15	9	9	Afternoon.	3	4	56	11	17	36	19	16	13	27	7	51
Last Quarter	22	6	54	Afternoon.	4	8	46	12	14	45	20	18	28	28	4	3
New	30	10	43	Afternoon.	5	12	17	13	10	54	21	19	36	29	0	4
In Perigee	15	8	0	Morning.	6	15	19	14	6	16	22	19	40	30	3	55
In Apogee	28	5	0	Morning.	7	17	43	15	1	12	23	18	44			
					8	19	16	16	3	N. 55	24	16	57			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

SEPTEMBER, 1864.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
		Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
		H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
Th.	1	6	50	35	5	7	6	35	10	10	9	15	4	10	23	15	6	11	6	10	7	11	20	10	8	●
F.	2	7	22	36	3	7	36	36	6	10	36	15	7	10	49	15	8	11	34	10	9	11	49	10	9	1.2
S.	3	7	52	36	6	8	7	36	6	11	3	15	8	11	18	15	7	—	—	—	—	0	5	10	9	2.2
S.	4	8	22	36	4	8	36	36	2	11	34	15	6	11	50	15	5	0	22	10	8	0	38	10	7	3.2
M.	5	8	49	35	10	9	4	35	5	—	—	—	—	0	6	15	3	0	53	10	6	1	9	10	5	4.2
Tu.	6	9	19	34	11	9	35	34	1	0	23	15	0	0	42	14	9	1	26	10	3	1	43	10	1	5.2
W.	7	9	50	33	3	10	6	32	4	1	2	14	4	1	22	14	0	2	2	9	11	2	22	9	9	6.2
Th.	8	10	23	31	5	10	43	30	6	1	45	13	8	2	8	13	4	2	44	9	6	3	7	9	4	7.2
F.	9	11	9	29	6	11	41	28	9	2	35	13	0	3	8	12	8	3	33	9	2	4	7	8	11	8
S.	10	—	—	—	—	0	19	28	4	3	46	12	5	4	30	12	5	4	44	8	9	5	23	8	9	9.2
S.	11	1	0	28	6	1	46	29	0	5	14	12	7	5	56	12	11	6	3	8	10	6	43	9	0	10.2
M.	12	2	28	29	11	3	9	31	2	6	34	13	4	7	8	13	10	7	21	9	4	7	56	9	8	11.2
Tu.	13	3	50	32	8	4	26	34	3	7	39	14	5	8	8	15	1	8	31	10	0	9	2	10	4	12.2
W.	14	4	57	35	10	5	25	37	4	8	32	15	8	8	54	16	3	9	30	10	8	9	53	11	0	13.2
Th.	15	5	51	38	7	6	16	39	7	9	15	16	8	9	37	17	1	10	14	11	3	10	34	11	6	○
F.	16	6	40	40	4	7	4	40	10	9	58	17	5	10	19	17	7	10	56	11	9	11	17	11	10	15.2
S.	17	7	27	41	2	7	49	40	11	10	40	17	8	11	1	17	6	11	40	11	10	—	—	—	—	16.2
S.	18	8	11	40	6	8	31	39	11	11	22	17	3	11	45	17	0	0	4	11	9	0	26	11	7	17.2
M.	19	8	51	39	0	9	10	38	0	—	—	—	—	0	8	16	7	0	48	11	5	1	11	11	2	18.2
Tu.	20	9	28	36	9	9	47	35	4	0	31	16	1	0	54	15	6	1	33	10	10	1	55	10	6	19.2
W.	21	10	5	33	9	10	24	32	3	1	18	14	11	1	43	14	3	2	18	10	2	2	43	9	10	20.2
Th.	22	10	46	30	10	11	10	29	5	2	9	13	8	2	39	13	2	3	8	9	6	3	37	9	3	☾
F.	23	11	40	28	3	—	—	—	—	3	11	12	7	3	47	12	3	4	8	8	11	4	44	8	8	22.2
S.	24	0	20	27	6	1	1	27	2	4	32	12	1	5	15	12	1	5	24	8	6	6	4	8	6	23.2
S.	25	1	44	27	3	2	23	27	9	5	55	12	2	6	30	12	5	6	42	8	8	7	17	8	10	24.2
M.	26	3	1	28	5	3	37	29	3	7	2	12	8	7	31	13	0	7	50	9	0	8	21	9	2	25.2
Tu.	27	4	9	30	4	4	35	31	4	7	56	13	5	8	17	13	10	8	48	9	5	9	11	9	8	26.2
W.	28	5	0	32	4	5	21	33	3	8	35	14	2	8	51	14	6	9	33	9	10	9	51	10	0	27.2
Th.	29	5	40	34	1	5	59	34	9	9	7	14	10	9	23	15	1	10	6	10	3	10	21	10	5	28.2
F.	30	6	18	35	4	6	35	35	10	9	38	15	4	9	54	15	6	10	36	10	7	10	51	10	8	●

Half Mean Spring } 18ft. 7in.
Range.

8ft. 0in.

5ft. 6in.

Equation of Time at Noon.

M. D.	M.	S.	Add.	M. D.	M.	S.	Add.	M. D.	M.	S.	Add.	M. D.	M.	S.	Add.
1	0	17	Add.	9	2	55	Add.	17	5	44	Add.	25	8	31	Add.
2	0	36		10	3	16		18	6	5		26	8	51	
3	0	55		11	3	37		19	6	26		27	9	11	
4	1	14		12	3	58		20	6	47		28	9	31	
5	1	34		13	4	19		21	7	8		29	9	51	
6	1	54		14	4	40		22	7	29		30	10	10	
7	2	14		15	5	1		23	7	50					
8	2	35		16	5	22		24	8	11					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

SEPTEMBER, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
Th.	1	0a 3	10 45	9 3	10 59	9 3	7 59	7 4	8 13	7 5	5 13	10 9	5 29	
F.	2	0 45	11 13	9 4	11 27	9 4	8 26	7 6	8 40	7 6	5 43	11 0	5 57	
S.	3	1 27	11 42	9 3	11 57	9 3	8 54	7 6	9 8	7 5	6 12	10 11	6 27	
S.	4	2 10	—	—	0 13	9 3	9 23	7 4	9 37	7 3	6 43	10 9	6 58	
M.	5	2 55	0 29	9 3	0 45	9 2	9 50	7 1	10 5	6 11	7 13	10 5	7 29	
Tu.	6	3 42	1 2	9 1	1 21	9 0	10 22	6 10	10 41	6 7	7 46	9 11	8 4	
W.	7	4 31	1 41	8 11	2 3	8 9	11 2	6 4	11 29	6 1	8 23	9 4	8 46	
Th.	8	5 23	2 27	8 7	2 51	8 5	11 57	5 10	—	—	9 12	8 9	9 41	
F.	9	6 17	3 17	8 4	3 49	8 2	0 31	5 7	1 11	5 6	10 17	8 4	10 56	
S.	10	7 13	4 25	8 1	5 4	8 0	1 57	5 5	2 41	5 6	11 37	8 2	—	
S.	11	8 10	5 44	8 0	6 27	8 1	3 22	5 9	4 0	6 1	0 18	8 4	1 1	
M.	12	9 7	7 6	8 2	7 42	8 5	4 33	6 4	5 1	6 8	1 39	8 10	2 15	
Tu.	13	10 3	8 13	8 8	8 41	9 0	5 27	6 11	5 52	7 3	2 45	9 9	3 12	
W.	14	10 59	9 6	9 3	9 29	9 6	6 16	7 7	6 40	7 10	3 34	10 9	3 55	
Th.	15	11 55	9 51	9 9	10 13	9 11	7 4	8 1	7 27	8 4	4 17	11 8	4 40	
F.	16	morn.	10 35	10 0	10 56	10 0	7 49	8 6	8 9	8 7	5 3	12 3	5 26	
S.	17	0 50	11 18	10 0	11 39	10 0	8 31	8 7	8 51	8 6	5 48	12 5	6 9	
S.	18	1 46	—	—	0 1	9 11	9 12	8 4	9 32	8 1	6 31	12 1	6 53	
M.	19	2 41	0 24	9 10	0 47	9 8	9 52	7 10	10 12	7 6	7 15	11 4	7 36	
Tu.	20	3 37	1 9	9 6	1 32	9 4	10 33	7 3	10 57	6 10	7 56	10 6	8 19	
W.	21	4 31	1 58	9 1	2 25	8 10	11 27	6 5	12 0	6 0	8 44	9 6	9 13	
Th.	22	5 24	2 52	8 7	3 21	8 4	—	—	0 37	5 8	9 45	8 8	10 19	
F.	23	6 16	3 50	8 2	4 25	8 0	1 16	5 6	1 59	5 4	10 56	8 1	11 39	
S.	24	7 4	5 6	7 11	5 46	7 10	2 43	5 4	3 23	5 6	—	—	0 19	
S.	25	7 51	6 25	7 10	7 2	7 10	3 59	5 8	4 29	5 10	0 59	8 0	1 35	
M.	26	8 36	7 36	8 0	8 6	8 2	4 57	6 0	5 21	6 2	2 9	8 4	2 38	
Tu.	27	9 19	8 30	8 4	8 50	8 7	5 42	6 5	6 1	6 7	3 1	9 0	3 21	
W.	28	10 2	9 9	8 9	9 26	8 11	6 19	6 9	6 37	6 11	3 38	9 8	3 53	
Th.	29	10 44	9 42	9 1	9 58	9 2	6 54	7 1	7 11	7 3	4 8	10 3	4 24	
F.	30	11 26	10 14	9 3	10 30	9 4	7 28	7 4	7 44	7 5	4 41	10 8	4 58	
Half Mean Spring Range.			4 ft. 9 in.				3 ft. 10 in.				5 ft. 7 in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°
New	—	—	1	6	8	Morning.	1	3	N. 5	9	19	8. 50	17	8 N. 45
First Quarter	—	—	9	5	50	Morning.	2	0	8. 56	10	19	19	18	12 56
Full	—	—	15	9	9	Afternoon.	3	4	56	11	17	36	19	16 13
Last Quarter	—	—	22	6	54	Afternoon.	4	8	46	12	14	45	20	18 28
New	—	—	30	10	43	Afternoon.	5	12	17	13	10	54	21	19 36
In Perigee	—	—	15	8	0	Morning.	6	15	19	14	6	16	22	19 40
In Apogee	—	—	28	5	0	Morning.	7	17	42	15	1	12	23	18 44
							8	19	16	16	3	N. 55	24	16 57

The times for High Water are given for Mean Time at Place ; if Dublin or Railway Time be required
 BELFAST subtract 8 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

SEPTEMBER, 1864.

GALWAY.				QUEENSTOWN.				WATERFORD.				C'S AGE AT NOON.
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	
4 32 14 0		4 46 14 2		4 56 11 3		5 12 11 4		5 19 11 10		5 34 12 0	●	
5 1 14 4		5 16 14 6		5 28 11 5		5 43 11 6		5 48 12 1		6 3 12 2	1'2	
5 32 14 6		5 48 14 5		5 59 11 6		6 15 11 6		6 19 12 2		6 36 12 2	2'2	
6 4 14 4		6 19 14 2		6 31 11 5		6 45 11 4		6 52 12 2		7 7 12 1	3'2	
6 34 14 0		6 50 13 9		7 0 11 3		7 16 11 1		7 21 12 0		7 36 11 11	4'2	
7 8 13 5		7 27 13 1		7 32 10 10		7 49 10 7		7 52 11 9		8 9 11 7	5'2	
7 47 12 9		8 9 12 3		8 7 10 5		8 25 10 1		8 26 11 4		8 43 11 1	6'2	
8 32 11 9		8 57 11 3		8 45 9 10		9 8 9 7		9 1 10 10		9 22 10 7	7'2	
9 28 10 11		10 4 10 8		9 34 9 4		10 5 9 1		9 51 10 3		10 27 10 0	☽	
0 45 10 7		11 29 10 10		10 44 9 0		11 26 9 1		11 5 9 10		11 44 9 10	9'2	
— —		0 13 11 1		— —		0 11 9 3		— —		0 24 10 0	10'2	
0 51 11 7		1 26 12 2		0 52 9 6		1 33 9 11		1 3 10 3		1 41 10 7	11'2	
1 56 12 10		2 26 13 6		2 10 10 4		2 41 10 10		2 20 11 1		2 56 11 7	12'2	
2 52 14 2		3 15 14 10		3 10 11 3		3 35 11 9		3 26 12 1		3 54 12 6	13'2	
3 37 15 4		4 0 15 10		3 59 12 2		4 23 12 6		4 20 12 11		4 46 13 2	○	
4 22 16 3		4 44 16 6		4 46 12 9		5 10 12 11		5 9 13 4		5 31 13 6	15'2	
5 7 16 7		5 30 16 6		5 34 12 11		5 57 12 11		5 54 13 7		6 17 13 7	16'2	
5 52 16 3		6 14 15 11		6 19 12 9		6 41 12 6		6 40 13 5		7 2 13 3	17'2	
6 36 15 5		6 58 14 11		7 2 12 3		7 22 11 10		7 23 13 0		7 43 12 9	18'2	
7 20 14 4		7 43 13 8		7 43 11 5		8 3 11 0		8 2 12 5		8 21 12 0	19'2	
8 8 12 11		8 33 12 1		8 23 10 6		8 46 10 1		8 41 11 6		9 2 11 1	20'2	
9 0 11 5		9 29 10 11		9 10 9 8		9 34 9 3		9 25 10 8		9 52 10 3	☾	
0 4 10 5		10 47 10 3		10 4 8 11		10 45 8 9		10 27 9 10		11 6 9 7	22'2	
1 30 10 3		— —		11 27 8 8		— —		11 45 9 5		— —	23'2	
0 11 10 4		0 47 10 7		0 9 8 8		0 47 8 10		0 23 9 5		0 58 9 7	24'2	
1 20 10 11		1 49 11 4		1 25 9 1		1 59 9 4		1 33 9 9		2 8 10 1	25'2	
2 13 11 9		2 35 12 2		2 28 9 7		2 51 9 11		2 39 10 5		3 5 10 8	26'2	
2 55 12 7		3 13 12 11		3 13 10 3		3 32 10 6		3 29 11 0		3 50 11 3	27'2	
3 29 13 3		3 45 13 7		3 49 10 9		4 7 11 0		4 9 11 6		4 29 11 9	28'2	
4 1 13 11		4 17 14 2		4 24 11 2		4 41 11 4		4 47 11 11		5 4 12 0	●	
Mean Spring } 7ft. 5in. Range.				5ft. 10in.				6ft. 2in.				

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
0 17		9	2 55		17	5 44		25	8 31	
0 36		10	3 16		18	6 5		26	8 51	
0 55		11	3 37		19	6 26		27	9 11	
1 14		12	3 58		20	6 47		28	9 31	
1 34		13	4 19		21	7 8		29	9 51	
1 54		14	4 40		22	7 29		30	10 10	
2 14		15	5 1		23	7 50				
2 35		16	5 22		24	8 11				

of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.

OCTOBER, 1864.

Week Day.	Month Day.	Moon's Transit.	BREST.				DEVONPORT.				PORTSMOUTH.																		
			Morning.		Afternoon.		Morning.		Afternoon.		Morning.		Afternoon.																
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.															
S.	1	08 9	3 41	18 7	3 57	18 9	5 37	14 11	5 53	15 3	11 37	12 5	11 53	1															
M.	2	0 53	4 13	18 10	4 28	18 9	6 9	15 1	6 25	15 2	—	—	0 10	1															
Tu.	3	1 40	4 43	18 8	4 59	18 6	6 40	15 1	6 54	14 11	0 27	12 6	0 44	1															
W.	4	2 28	5 15	18 4	5 31	18 0	7 8	14 10	7 24	14 7	0 59	12 4	1 16	1															
Th.	5	3 19	5 49	17 8	6 7	17 3	7 41	14 6	7 58	14 1	1 33	12 2	1 50	1															
F.	6	4 12	6 27	16 9	6 49	16 1	8 16	14 1	8 34	13 6	2 8	11 9	2 28	1															
S.	7	5 6	7 14	15 6	7 39	14 11	8 54	13 7	9 17	12 10	2 50	11 4	3 13	1															
M.	8	6 1	8 8	14 5	8 41	14 0	9 43	13 0	10 13	12 4	3 37	10 10	4 5	1															
Tu.	9	6 55	9 18	13 10	10 3	14 0	10 49	12 9	11 26	12 1	4 37	10 3	5 13	1															
W.	10	7 50	10 49	14 4	11 32	14 10	—	—	0 13	12 10	5 55	10 2	6 38	1															
Th.	11	8 44	—	—	0 8	15 7	0 58	12 6	1 40	13 7	7 19	10 7	7 57	1															
F.	12	9 39	0 42	16 5	1 11	17 4	2 18	13 5	2 53	14 7	8 33	11 6	9 3	1															
S.	13	10 33	1 36	18 3	2 0	19 1	3 21	14 6	3 50	15 6	9 30	12 5	9 55	1															
M.	14	11 28	2 23	19 10	2 46	20 5	4 17	15 5	4 43	16 3	10 19	13 1	10 42	1															
Tu.	15	morn.	3 9	20 10	3 31	20 11	5 7	16 2	5 30	16 7	11 7	13 6	11 28	1															
W.	16	0 24	3 54	20 11	4 17	20 10	5 54	16 5	6 16	16 6	11 51	13 7	—	1															
Th.	17	1 21	4 39	20 7	5 1	20 2	6 38	16 4	6 59	16 1	0 14	13 6	0 37	1															
F.	18	2 17	5 21	19 6	5 41	19 0	7 21	15 11	7 37	15 6	1 0	13 2	1 22	1															
S.	19	3 13	6 2	18 3	6 23	17 5	7 56	15 3	8 14	14 7	1 43	12 7	2 3	1															
M.	20	4 6	6 45	16 7	7 9	15 9	8 34	14 5	8 52	13 6	2 24	11 11	2 46	1															
Tu.	21	4 58	7 34	14 11	8 0	14 2	9 14	13 6	9 37	12 6	3 9	11 2	3 32	1															
W.	22	5 46	8 29	13 7	9 1	13 2	10 2	12 8	10 32	11 8	3 57	10 5	4 25	1															
Th.	23	6 32	9 40	13 0	10 20	12 0	11 2	12 1	11 40	11 4	4 55	9 10	5 32	1															
F.	24	7 16	11 1	13 2	11 37	13 5	—	—	0 20	12 1	6 10	9 7	6 50	1															
S.	25	7 59	—	—	0 11	13 11	0 58	11 8	1 34	12 7	7 25	9 11	7 59	1															
M.	26	8 41	0 41	14 5	1 5	14 11	2 9	12 4	2 36	13 3	8 31	10 6	8 56	1															
Tu.	27	9 23	1 26	15 6	1 45	16 2	3 2	13 8	3 26	13 11	9 18	11 1	9 39	1															
W.	28	10 6	2 3	16 8	2 20	17 2	3 49	14 0	4 10	14 6	9 58	11 7	10 16	1															
Th.	29	10 50	2 37	17 9	2 54	18 1	4 30	14 6	4 48	14 9	10 32	12 0	10 49	1															
F.	30	11 36	3 11	18 4	3 28	18 6	5 6	14 11	5 23	15 0	11 7	12 3	11 23	1															
S.	31	02 25	3 45	18 7	4 3	18 8	5 41	15 1	5 58	15 2	11 41	12 5	12 0	1															
Half Mean Spring Range.			9 ft. 6 in.				7 ft. 9 in.				6 ft. 4 in.																		
Phases of the Moon.															Moon's Declination at Noon.														
D. H. M.															M.D. ° ' "														
First Quarter - 8 3 37 Afternoon.															1 7 8.48 9 15 8.40 17 17 N. 34 25 5														
Full - - - - 15 6 15 Morning.															2 11 24 10 12 16 18 19 10 26 1														
Last Quarter - 22 11 27 Morning.															3 14 33 11 8 5 19 19 38 27 2														
New - - - - 30 3 28 Afternoon.															4 17 4 12 3 19 20 19 2 28 6														
															5 18 49 13 1 N. 41 21 17 29 29 10														
In Perigee - - 13 6 0 Afternoon.															6 19 38 14 6 36 22 15 9 30 13														
In Apogee - - 25 6 0 Afternoon.															7 19 24 15 11 5 23 12 13 31 16														
															8 18 4 16 14 49 24 8 49														

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 Brest add 18 m. | Devonport add 17 m. | Portsmouth add 4 m.

SEPTEMBER, 1864.

MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.						
1	4 32 14 0	4 46 14 2	4 56 11 3	5 12 11 4	5 19 11 10	5 34 12 0	●																		
2	5 1 14 4	5 16 14 6	5 28 11 5	5 43 11 6	5 48 12 1	6 3 12 2	1' 2																		
3	5 32 14 6	5 48 14 5	5 59 11 6	6 15 11 6	6 19 12 2	6 36 12 2	2' 2																		
4	6 4 14 4	6 19 14 2	6 31 11 5	6 45 11 4	6 52 12 2	7 7 12 1	3' 2																		
5	6 34 14 0	6 50 13 9	7 0 11 3	7 16 11 1	7 21 12 0	7 36 11 11	4' 2																		
6	7 8 13 5	7 27 13 1	7 32 10 10	7 49 10 7	7 52 11 9	8 9 11 7	5' 2																		
7	7 47 12 9	8 9 12 3	8 7 10 5	8 25 10 1	8 26 11 4	8 43 11 1	6' 2																		
8	8 32 11 9	8 57 11 3	8 45 9 10	9 8 9 7	9 1 10 10	9 22 10 7	7' 2																		
9	9 28 10 11	10 4 10 8	9 34 9 4	10 5 9 1	9 51 10 3	10 27 10 0	●																		
10	10 45 10 7	11 29 10 10	10 44 9 0	11 26 9 1	11 5 9 10	11 44 9 10	9' 2																		
11	— —	0 13 11 1	— —	0 11 9 3	— —	0 24 10 0	10' 2																		
12	0 51 11 7	1 26 12 2	0 52 9 6	1 33 9 11	1 3 10 3	1 41 10 7	11' 2																		
13	1 56 12 10	2 26 13 6	2 10 10 4	2 41 10 10	2 20 11 1	2 56 11 7	12' 2																		
14	2 52 14 2	3 15 14 10	3 10 11 3	3 35 11 9	3 26 12 1	3 54 12 6	13' 2																		
15	3 37 15 4	4 0 15 10	3 59 12 2	4 23 12 6	4 20 12 11	4 46 13 2	○																		
16	4 22 16 3	4 44 16 6	4 46 12 9	5 10 12 11	5 9 13 4	5 31 13 6	15' 2																		
17	5 7 16 7	5 30 16 6	5 34 12 11	5 57 12 11	5 54 13 7	6 17 13 7	16' 2																		
18	5 52 16 3	6 14 15 11	6 19 12 9	6 41 12 6	6 40 13 5	7 2 13 3	17' 2																		
19	6 36 15 5	6 58 14 11	7 2 12 3	7 22 11 10	7 23 13 0	7 43 12 9	18' 2																		
20	7 20 14 4	7 43 13 8	7 43 11 5	8 3 11 0	8 2 12 5	8 21 12 0	19' 2																		
21	8 8 12 11	8 33 12 1	8 23 10 6	8 46 10 1	8 41 11 6	9 2 11 1	20' 2																		
22	9 0 11 5	9 29 10 11	9 10 9 8	9 34 9 3	9 25 10 8	9 52 10 3	●																		
23	10 4 10 5	10 47 10 3	10 4 8 11	10 45 8 9	10 27 9 10	11 6 9 7	22' 2																		
24	11 30 10 3	— —	11 27 8 8	— —	11 45 9 5	— —	23' 2																		
25	0 11 10 4	0 47 10 7	0 9 8 8	0 47 8 10	0 23 9 5	0 58 9 7	24' 2																		
26	1 20 10 11	1 49 11 4	1 25 9 1	1 59 9 4	1 33 9 9	2 8 10 1	25' 2																		
27	2 13 11 9	2 35 12 2	2 28 9 7	2 51 9 11	2 39 10 5	3 5 10 8	26' 2																		
28	2 55 12 7	3 13 12 11	3 13 10 3	3 32 10 6	3 29 11 0	3 50 11 3	27' 2																		
29	3 29 13 3	3 45 13 7	3 49 10 9	4 7 11 0	4 9 11 6	4 29 11 9	28' 2																		
30	4 1 13 11	4 17 14 2	4 24 11 2	4 41 11 4	4 47 11 11	5 4 12 0	●																		
Half Mean Spring } 7ft. 5in. 5ft. 10in. 6ft. 2in.																									

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
0 17		9	2 55		17	5 44		25	8 31	
0 36		10	3 16		18	6 5		26	8 51	
0 55		11	3 37		19	6 26		27	9 11	
1 14		12	3 58		20	6 47		28	9 31	
1 34		13	4 19		21	7 8		29	9 51	
1 54		14	4 40		22	7 29		30	10 10	
2 14		15	5 1		23	7 50				
2 35		16	5 22		24	8 11				

Times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.

OCTOBER, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRAMSET.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTER.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
S.	1	0 29	—	—	0 12 11	5	6 30 20	3	6 45 20	5	3 22 13	11	3 37	
M.	2	0 53	0 27 11	6	0 41 11	6	7 0 20	7	7 17 20	8	3 52 14	2	4 7	
Tu.	3	1 40	0 57 11	6	1 14 11	5	7 33 20	7	7 48 20	6	4 22 14	3	4 38	
W.	4	2 28	1 29 11	4	1 45 11	3	8 3 20	5	8 19 20	3	4 54 14	0	5 10	
Th.	5	3 19	2 2 11	2	2 19 11	0	8 36 19	11	8 54 19	7	5 27 13	7	5 45	
F.	6	4 12	2 36 10	10	2 55 10	8	9 13 19	2	9 33 18	8	6 4 12	11	6 27	
S.	7	5 6	3 15 10	6	3 36 10	4	9 55 18	2	10 20 17	9	6 51 12	4	7 16	
M.	8	6 1	3 59 10	2	4 24 10	0	10 50 17	3	11 24 16	10	7 43 11	8	8 14	
Tu.	9	6 55	4 54 9	10	5 27 9	9	—	—	0 3 16	6	8 49 11	—	9 29	
W.	10	7 50	6 4 9	9	6 53 9	10	0 42 16	5	1 23 16	6	10 14 11	2	10 55	
Th.	11	8 44	7 37 10	0	8 17 10	3	2 2 16	10	2 39 17	6	11 32 11	9	—	
F.	12	9 39	8 52 10	7	9 25 10	11	3 13 18	4	3 46 19	2	0 5 12	3	0 36	
S.	13	10 33	9 54 11	3	10 20 11	6	4 14 19	11	4 38 20	8	1 4 13	5	1 31	
M.	14	11 28	10 45 11	10	11 9 12	1	5 1 21	3	5 25 21	9	1 56 14	5	2 21	
Tu.	15	morn.	11 33 12	3	11 56 12	4	5 49 22	1	6 13 22	4	2 44 15	1	3 6	
W.	16	0 24	—	—	0 17 12	4	6 35 22	5	6 58 22	6	3 27 15	6	3 49	
Th.	17	1 21	0 39 12	3	1 2 12	2	7 21 22	5	7 43 22	2	4 11 15	6	4 32	
F.	18	2 17	1 24 12	0	1 46 11	10	8 4 21	9	8 26 21	4	4 54 15	0	5 16	
S.	19	3 13	2 8 11	7	2 29 11	4	8 46 20	8	9 8 20	0	5 37 14	1	5 59	
M.	20	4 6	2 50 11	1	3 11 10	9	9 29 19	3	9 51 18	7	6 22 13	1	6 47	
Tu.	21	4 58	3 32 10	6	3 55 10	3	10 16 17	11	10 44 17	3	7 12 12	1	7 38	
W.	22	5 46	4 19 10	0	4 46 9	9	11 15 16	8	11 50 16	2	8 5 11	3	8 37	
Th.	23	6 32	5 14 9	7	5 47 9	5	—	—	0 25 15	9	9 11 10	8	9 51	
F.	24	7 16	6 28 9	5	7 10 9	5	1 1 15	7	1 37 15	8	10 29 10	6	11 6	
S.	25	7 59	7 49 9	7	8 22 9	9	2 17 15	11	2 44 16	4	11 37 10	11	—	
M.	26	8 41	8 55 9	11	9 24 10	2	3 16 16	10	3 46 17	4	0 7 11	3	0 35	
Tu.	27	9 23	9 48 10	4	10 10 10	7	4 8 17	10	4 29 18	4	0 58 11	11	1 19	
W.	28	10 6	10 29 10	9	10 47 10	11	4 47 18	9	5 4 19	2	1 40 12	8	1 59	
Th.	29	10 50	11 5 11	1	11 22 11	3	5 21 19	6	5 38 19	10	2 17 13	2	2 34	
F.	30	11 36	11 40 11	4	11 57 11	5	5 56 20	0	6 14 20	2	2 51 13	8	3 7	
S.	31	0 25	—	—	0 13 11	5	6 31 20	4	6 49 20	5	3 23 13	11	3 40	

Half Mean Spring }
Range.

5ft. 9in.

10ft. 5in.

7ft. 2in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
First Quarter	8	3	37	Afternoon.	1	7	58.48		9	15	58.40		17	17	N.34		25	5	
Full	15	6	15	Morning.	2	11	24		10	12	16		18	19	10		26	1	
Last Quarter	22	11	27	Morning.	3	14	33		11	8	5		19	19	38		27	2	
New	30	3	28	Afternoon.	4	17	4		12	3	19		20	19	2		28	6	
					5	18	49		13	1	N.41		21	17	29		29	10	
In Perigee	13	6	0	Afternoon.	6	19	38		14	3	36		22	15	9		30	13	
In Apogee	25	6	0	Afternoon.	7	19	24		15	11	5		23	12	13		31	16	
					8	18	4		16	14	49		24	8	49				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required

HARWICH subtract 5 m.

HULL add 1 m.

SUNDERLAND add 5 m.

OCTOBER, 1864.

NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.	
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.			
Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.		D.
3 23	12 10	3 38	12 11	2 21	15 11	2 36	16 0	8 24	13 0	8 38	13 1	0.6	
3 52	13 0	4 8	13 1	2 50	16 1	3 4	16 1	8 53	13 1	9 8	13 0	1.6	
4 24	13 0	4 40	12 11	3 19	16 0	3 35	15 11	9 25	12 11	9 41	12 9	2.6	
4 56	12 9	5 13	12 6	3 51	15 9	4 8	15 6	9 58	12 6	10 16	12 3	3.6	
5 31	12 4	5 49	12 2	4 26	15 4	4 43	15 1	10 34	12 0	10 54	11 8	4.6	
6 8	11 11	6 29	11 7	5 2	14 9	5 25	14 6	11 17	11 3	11 41	10 11	5.6	
6 52	11 3	7 19	10 11	5 49	14 1	6 15	13 8	—	—	0 7	10 6	6.6	
7 48	10 6	8 21	10 2	6 42	13 4	7 16	13 0	0 34	10 2	1 6	9 11	7	
8 59	10 0	9 42	9 11	7 53	12 9	8 34	12 8	1 44	9 8	2 26	9 7	8.6	
10 26	10 1	11 7	10 5	9 20	12 9	10 1	13 0	3 16	9 8	4 0	9 10	9.6	
11 46	10 9	—	—	10 39	13 5	11 12	13 11	4 40	10 1	5 14	10 6	10.6	
0 19	11 3	0 48	11 9	11 43	14 5	—	—	5 44	11 2	6 9	11 10	11.6	
1 14	12 3	1 37	12 9	0 8	15 1	0 32	15 8	6 31	12 6	6 51	13 2	12.6	
2 0	13 3	2 22	13 8	0 55	16 4	1 19	16 10	7 11	13 9	7 31	14 3	13.6	
2 44	14 0	3 6	14 3	1 42	17 3	2 5	17 6	7 53	14 6	8 14	14 7	14.6	
3 28	14 4	3 50	14 5	2 26	17 7	2 46	17 7	8 34	14 6	8 56	14 5	15.6	
4 12	14 4	4 34	14 0	3 7	17 5	3 29	17 2	9 19	14 2	9 42	13 10	16.6	
4 57	13 8	5 20	13 4	3 52	16 10	4 14	16 5	10 5	13 4	10 26	12 10	17.6	
5 42	12 11	6 3	12 6	4 36	15 11	4 57	15 6	10 48	12 4	11 12	11 9	18.6	
6 25	12 0	6 48	11 7	5 20	15 0	5 45	14 5	11 37	11 3	—	—	19.6	
7 14	11 0	7 42	10 6	6 11	13 10	6 37	13 3	0 2	10 8	0 29	10 2	20.6	
8 12	10 0	8 46	9 8	7 7	12 10	7 40	12 5	0 57	9 9	1 31	9 4	21.6	
9 23	9 6	10 3	9 5	8 15	12 2	8 57	12 0	2 7	9 1	2 50	8 11	22.6	
10 41	9 6	11 19	9 8	9 36	12 1	10 12	12 3	3 33	8 11	4 12	9 0	23.6	
11 51	9 11	—	—	10 44	12 5	11 14	12 9	4 45	9 2	5 16	9 5	24.6	
0 21	10 2	0 48	10 6	11 43	13 1	—	—	5 44	9 9	6 6	10 2	25.6	
1 10	10 9	1 28	11 1	0 4	13 5	0 22	13 10	6 23	10 7	6 40	11 1	26.6	
1 46	11 5	2 3	11 9	0 40	14 3	0 58	14 8	6 55	11 6	7 9	11 11	27.6	
2 20	12 1	2 35	12 4	1 15	15 0	1 32	15 4	7 23	12 4	7 38	12 7	28.6	
2 51	12 6	3 8	12 9	1 49	15 7	2 6	15 10	7 54	12 10	8 10	12 11	29.6	
3 24	12 10	3 41	12 11	2 22	15 11	2 38	16 0	8 26	13 0	8 43	13 0	30.6	
Mean Spring } Range.				6ft. 8in.				8ft. 2in.				6ft. 7in.	

Equation of Time at Noon.

M. S.		M. D.	M. S.		M. D.	M. S.		M. D.	M. S.	
10 29	Add.	9	12 49	Add.	17	14 41	Add.	25	15 53	Add.
10 48		10	13 5		18	14 52		26	15 59	
11 6		11	13 20		19	15 3		27	16 4	
11 24		12	13 35		20	15 13		28	16 9	
11 42		13	13 49		21	15 22		29	16 12	
11 59		14	14 3		22	15 31		30	16 15	
12 16		15	14 16		23	15 39		31	16 17	
12 33		16	14 29		24	15 47				

es of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

OCTOBER, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.					
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTER.			
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.			
S.	1	00 9	—	—	0 5	9 6	11 17	25 5	11 33	25 7	6 9	20 5	6 24			
M.	2	0 53	0 21	9 7	0 37	9 8	11 49	25 8	—	—	6 40	20 9	6 55			
Tu.	3	1 40	0 53	9 8	1 10	9 8	0 42	25 8	0 20	25 7	7 10	20 7	7 26			
W.	4	2 28	1 25	9 7	1 41	9 7	0 36	25 5	0 52	25 2	7 42	20 3	7 59			
Th.	5	3 19	1 58	9 6	2 15	9 5	1 9	24 9	1 25	24 4	8 16	19 7	8 35			
F.	6	4 12	2 33	9 3	2 52	9 2	1 43	23 9	2 32	23 3	8 55	18 8	9 15			
S.	7	5 6	3 13	9 0	3 36	8 11	2 24	22 8	2 47	22 0	9 36	17 7	9 59			
M.	8	6 1	4 1	8 9	4 29	8 7	3 12	21 5	3 42	20 10	10 24	16 6	10 51			
Tu.	9	6 55	5 2	8 6	5 38	8 4	4 17	20 4	4 58	20 2	11 23	15 9	—			
W.	10	7 50	6 21	8 3	7 3	8 4	5 46	20 4	6 33	20 10	0 3	15 9	0 46			
Th.	11	8 44	7 44	8 6	8 20	8 9	7 13	21 6	7 49	22 5	1 32	16 6	2 12			
F.	12	9 39	8 55	9 1	9 24	9 3	8 20	23 5	8 47	24 5	2 49	18 3	3 20			
S.	13	10 33	9 51	9 6	10 16	9 9	9 11	25 4	9 34	26 2	3 50	20 2	4 18			
M.	14	11 28	10 42	9 11	11 7	10 0	9 57	26 11	10 21	27 5	4 45	21 8	5 11			
Tu.	15	morn.	11 31	10 2	11 55	10 3	10 44	27 9	11 7	28 0	5 36	22 7	5 59			
W.	16	0 24	—	—	0 18	10 3	11 30	28 0	11 52	27 11	6 21	22 10	6 43			
Th.	17	1 21	0 41	10 3	1 4	10 2	—	—	0 14	27 8	7 5	22 6	7 27			
F.	18	2 17	1 27	10 1	1 48	10 0	0 36	27 2	0 58	26 6	7 48	21 5	8 9			
S.	19	3 13	2 8	9 10	2 28	9 7	1 18	25 9	1 38	24 11	8 30	20 2	8 51			
M.	20	4 6	2 48	8 4	3 9	9 2	1 59	24 0	2 20	23 2	9 12	18 6	9 33			
Tu.	21	4 58	3 32	8 11	3 56	8 9	2 43	22 3	3 7	21 5	9 54	17 1	10 16			
W.	22	5 46	4 21	8 6	4 50	8 4	3 33	20 7	4 5	19 10	10 40	15 7	11 7			
Th.	23	6 32	5 21	8 2	5 58	8 0	4 40	19 4	5 21	19 11	11 41	14 10	—			
F.	24	7 16	6 36	7 11	7 15	8 0	6 4	19 3	6 45	19 6	0 17	14 9	0 59			
S.	25	7 59	7 49	8 1	8 23	8 3	7 18	19 11	7 51	20 6	1 37	15 2	2 14			
M.	26	8 41	8 53	8 5	9 18	8 7	8 20	21 1	8 42	21 9	2 47	16 2	3 13			
Tu.	27	9 23	9 39	8 9	10 0	8 11	9 22	22 4	9 20	23 0	3 36	17 5	3 59			
W.	28	10 6	10 19	9 0	10 37	9 1	9 38	23 6	9 54	24 0	4 20	18 6	4 40			
Th.	29	10 50	10 56	9 3	11 15	9 4	10 10	24 5	10 28	24 9	4 59	19 6	5 18			
F.	30	11 36	11 33	9 5	11 51	9 6	10 45	25 0	11 32	25 3	5 37	20 1	5 55			
S.	31	0 25	—	—	0 9	9 6	11 20	25 5	11 38	25 6	6 12	20 6	6 30			
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.					
Phases of the Moon.							Moon's Declination at Noon.									
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'	
First Quarter							8	3	37	Afternoon.	1	7	8.48	9	15	8.40
Full							15	6	15	Morning.	2	11	24	10	12	16
Last Quarter							22	11	27	Morning.	3	14	33	11	8	5
New							30	3	28	Afternoon.	4	17	4	12	3	19
							5	18	49		13	1	N.41	21	17	29
In Perigee							13	6	0	Morning.	6	19	38	14	6	36
In Apogee							25	6	0	Afternoon.	7	19	24	15	11	5
							8	18	4		16	14	49	24	8	49

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required

GREENOCK add 10 m.

LIVERPOOL add 12 m.

PEMBROKE add 20 m.

OCTOBER, 1864.

WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's Age at Noon.
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
Time. H. M. P. L.	Height.	Time. H. M. P. L.	Height.	Time. H. M. P. L.	Height.	Time. H. M. P. L.	Height.	Time. H. M. P. L.	Height.	Time. H. M. P. L.	Height.	
6 51 36 2		7 7 36 7		10 9 15 8		10 22 15 9		11 6 10 9		11 20 10 10		0.6
7 23 36 10		7 38 36 10		10 36 15 10		10 50 15 9		11 36 10 10		11 52 10 10		1.6
7 54 36 8		8 9 36 6		11 5 15 8		11 21 15 7		— — — —		0 9 10 9		2.6
8 24 36 3		8 40 35 10		11 39 15 5		11 57 15 2		0 25 10 8		0 42 10 7		3.6
8 56 35 4		9 12 34 8		— — — —		0 16 14 11		1 0 10 5		1 18 10 3		4.6
9 30 33 11		9 48 33 0		0 36 14 8		0 59 14 3		1 37 10 0		1 59 9 10		5.6
10 6 32 1		10 26 31 2		1 22 13 11		1 48 13 7		2 22 9 8		2 47 9 6		6.6
10 51 30 3		11 22 29 6		2 15 13 3		2 47 12 11		3 14 9 3		3 46 9 1		7.6
11 58 29 0		— — — —		3 25 12 9		4 7 12 8		4 23 8 11		5 2 8 10		8.6
0 40 29 0		1 24 29 6		4 53 12 10		5 35 13 1		5 44 8 11		6 22 9 1		9.6
2 6 30 3		2 45 31 6		6 13 13 6		6 46 14 0		7 0 9 5		7 34 9 8		10.6
3 23 32 9		3 58 34 3		7 16 14 6		7 43 15 1		8 7 10 0		8 36 10 4		11.6
4 29 35 9		4 58 37 1		8 7 15 8		8 30 16 2		9 4 10 8		9 29 10 11		12.6
5 26 38 3		5 52 39 1		8 52 16 7		9 15 16 11		9 52 11 2		10 13 11 5		13.6
6 18 39 1		6 42 39 11		9 38 17 2		9 59 17 3		10 34 11 7		10 56 11 8		14.6
7 5 40 2		7 27 40 1		10 19 17 3		10 59 17 2		11 18 11 8		11 40 11 7		15.6
7 48 39 8		8 9 39 1		11 0 17 0		11 23 16 8		— — — —		0 3 11 5		16.6
8 30 38 3		8 49 37 4		11 46 16 3		— — — —		0 25 11 3		0 45 11 0		17.6
9 7 36 3		9 26 35 0		0 8 15 10		0 31 15 4		1 8 10 9		1 32 10 5		18.6
9 45 33 9		10 3 32 4		0 54 14 9		1 18 14 3		1 55 10 1		2 18 9 10		19.6
10 22 31 1		10 44 29 10		1 44 13 9		2 10 13 3		2 43 9 7		3 9 9 3		20.6
11 10 28 9		11 41 27 11		2 38 12 9		3 12 12 5		3 37 9 0		4 10 8 9		21.6
— — — —		0 17 27 5		3 48 12 2		4 30 12 0		4 45 8 7		5 21 8 6		22.6
0 56 27 4		1 36 27 7		5 9 12 2		5 46 12 4		5 58 8 7		6 33 8 9		23.6
2 11 28 1		2 46 28 9		6 18 12 6		6 48 12 10		7 5 8 11		7 36 9 1		24.6
3 21 29 6		3 49 30 4		7 16 13 2		7 38 13 0		8 6 9 3		8 30 9 5		25.6
4 14 31 4		4 38 32 4		7 58 13 10		8 16 14 3		8 52 9 8		9 13 9 10		26.6
5 1 33 2		5 21 34 0		8 33 14 6		8 49 14 10		9 32 10 0		9 49 10 3		27.6
5 40 34 9		6 0 35 3		9 5 15 1		9 22 15 3		10 4 10 5		10 20 10 7		28.6
6 19 35 8		6 37 35 11		9 39 15 6		9 55 15 7		10 36 10 8		10 52 10 9		29.6
6 55 36 3		7 13 36 6		10 11 15 8		10 26 15 8		11 9 10 10		11 26 10 9		30.6
Mean Spring Range.		18 ^{ft.} 7 ^{in.}		8 ^{ft.} 0 ^{in.}		5 ^{ft.} 6 ^{in.}						

Equation of Time at Noon.

M. A.	Add.	M.D.	M. A.	Add.	M.D.	M. A.	Add.	M.D.	M. A.	Add.
10 29		9	12 49		17	14 41		25	15 53	
10 48		10	13 5		18	14 52		26	15 59	
11 6		11	13 20		19	15 3		27	16 4	
11 24		12	13 35		20	15 13		28	16 9	
11 42		13	13 49		21	15 22		29	16 12	
11 59		14	14 3		22	15 31		30	16 15	
12 16		15	14 16		23	15 39		31	16 17	
12 33		16	14 29		24	15 47				

Use of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

TIDE TABLES FOR THE

OCTOBER, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.	
S.	1	0 09	10 45	9 4	10 59	9 4	7 59	7 6	8 13	7 7	5 14	11 0	5 29	11 0	
S.	2	0 53	11 14	9 4	11 28	9 4	8 27	7 7	8 41	7 7	5 44	11 2	5 58	11 2	
M.	3	1 40	11 44	9 4	12 0	9 3	8 55	7 6	9 10	7 4	6 14	10 11	6 30	10 11	
Tu.	4	2 28	—	—	0 18	9 3	9 25	7 3	9 41	7 1	6 47	10 7	7 4	10 7	
W.	5	3 19	0 36	9 2	0 54	9 1	9 57	6 11	10 16	6 9	7 21	10 3	7 39	10 3	
Th.	6	4 12	1 15	9 0	1 38	8 10	10 37	6 6	11 3	6 3	8 0	9 6	8 23	9 6	
F.	7	5 6	2 3	8 8	2 30	8 6	11 34	6 0	—	—	8 50	8 11	9 21	8 11	
S.	8	6 1	2 57	8 5	3 29	8 3	0 10	5 9	0 49	5 8	9 55	8 6	10 34	8 6	
S.	9	6 55	4 4	8 2	4 43	8 2	1 34	5 7	2 19	5 8	11 15	8 4	11 58	8 4	
M.	10	7 50	5 25	8 1	6 5	8 2	3 3	5 10	3 40	6 2	—	—	0 39	—	
Tu.	11	8 44	6 45	8 3	7 20	8 5	4 14	6 5	4 41	6 9	1 18	8 11	1 52	8 11	
W.	12	9 39	7 51	8 8	8 17	8 11	5 5	7 0	5 28	7 4	2 23	9 9	2 48	9 9	
Th.	13	10 33	8 41	9 3	9 4	9 6	5 51	7 7	6 15	7 10	3 11	10 8	3 32	10 8	
F.	14	11 28	9 28	9 8	9 51	9 10	6 40	8 0	7 4	8 2	3 54	11 6	4 17	11 6	
S.	15	morn.	10 13	9 11	10 35	9 11	7 28	8 4	7 49	8 5	4 41	12 0	5 4	12 0	
S.	16	0 24	10 56	9 11	11 17	9 10	8 9	8 5	8 29	8 4	5 26	12 2	5 47	12 2	
M.	17	1 21	11 39	9 9	—	—	8 50	8 2	9 11	7 11	6 9	11 11	6 32	11 11	
Tu.	18	2 17	0 1	9 8	0 24	9 7	9 31	7 8	9 50	7 5	6 54	11 3	7 14	11 3	
W.	19	3 13	0 46	9 5	1 9	9 3	10 11	7 1	10 33	6 9	7 34	10 4	7 55	10 4	
Th.	20	4 6	1 33	9 0	1 59	8 10	10 59	6 5	11 30	6 1	8 19	9 5	8 45	9 5	
F.	21	4 58	2 25	8 7	2 52	8 5	—	—	0 3	5 9	9 15	8 8	9 46	8 8	
S.	22	5 46	3 20	8 3	3 52	8 1	0 39	5 6	1 19	5 5	10 21	8 2	10 57	8 2	
S.	23	6 32	4 26	8 0	5 2	7 11	2 0	5 4	2 40	5 4	11 35	7 11	—	—	
M.	24	7 16	5 39	7 10	6 17	7 10	3 17	5 6	3 50	5 9	0 13	8 0	0 51	8 0	
Tu.	25	7 59	6 50	7 11	7 22	8 0	4 18	5 11	4 44	6 1	1 23	8 3	1 55	8 3	
W.	26	8 41	7 51	8 2	8 12	8 4	5 7	6 3	5 26	6 5	2 23	8 9	2 44	8 9	
Th.	27	9 23	8 31	8 6	8 50	8 9	5 43	6 7	6 0	6 9	3 2	9 4	3 20	9 4	
F.	28	10 6	9 8	8 11	9 25	9 0	6 18	6 11	6 36	7 1	3 35	9 11	3 51	9 11	
S.	29	10 50	9 41	9 2	9 58	9 3	6 53	7 3	7 11	7 4	4 7	10 5	4 24	10 5	
S.	30	11 36	10 15	9 4	10 31	9 4	7 29	7 5	7 45	7 6	4 42	10 10	5 0	10 10	
M.	31	0 25	10 48	9 4	11 4	9 4	8 1	7 7	8 17	7 7	5 17	11 0	5 34	11 0	
Half Mean Spring Range.			4ft. 9in.				3ft. 10in.				5ft. 7in.				
Phases of the Moon.							Moon's Declination at Noon.								
			D. H. M.				M. D.			M. D.			M. D.		
First Quarter			8	3	37	Afternoon.	1	7	8.48	9	15	8.40	17	17	N.34
Full - - - - -			15	6	15	Morning.	2	11	24	10	12	16	18	19	10
Last Quarter -			22	11	27	Morning.	3	14	33	11	8	5	19	19	38
New - - - - -			30	3	28	Afternoon.	4	17	4	12	3	19	20	19	2
							5	18	49	13	1	N.41	21	17	29
In Perigee - -			13	6	0	Afternoon.	6	19	38	14	6	36	22	15	9
In Apogee - -			25	6	0	Afternoon.	7	19	24	15	11	5	23	12	13
							8	18	4	16	14	49	24	8	49

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required
 BELFAST subtract 3 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

OCTOBER, 1864.

GALWAY.										QUEENSTOWN.										WATERFORD.										C's Age at Noon.
MORNING.					AFTERNOON.					MORNING.					AFTERNOON.					MORNING.					AFTERNOON.					
Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.		Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.		Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.		Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.		Time. H. M. P. I.	Height.	D.								
1 4 32 14 4	4 46 14 6	4 57 11 6	5 13 11 7	5 20 12 1	5 34 12 2	0 6	2 5 2 14 8	5 18 14 7	5 29 11 8	5 45 11 8	5 50 12 3	6 6 12 3	1 6	3 5 35 14 6	5 51 14 5	6 2 11 7	6 18 11 6	6 22 12 3	6 38 12 2	2 6	4 6 8 14 3	6 25 14 0	6 34 11 5	6 51 11 3	6 55 12 2	7 12 12 1	3 6			
5 6 43 13 8	7 2 13 4	7 8 11 0	7 26 10 9	7 28 11 11	7 45 11 9	4 6	6 7 24 13 0	7 47 12 7	7 45 10 7	8 5 10 4	8 4 11 6	8 24 11 3	5 6	7 8 12 12 1	8 39 11 7	8 26 10 0	8 51 9 9	8 44 11 0	9 5 10 9	6 6	8 9 8 11 3	9 43 11 0	9 16 9 6	9 46 9 4	9 32 10 6	10 6 10 3	7			
9 10 23 10 11	11 8 11 0	10 22 9 2	11 6 9 3	10 44 10 1	11 25 10 0	8 6	10 11 51 11 4	—	11 49 9 4	—	—	0 3 10 1	9 6	1 0 30 11 9	1 4 12 4	0 30 9 7	1 8 10 0	0 41 10 4	1 18 10 9	10 6	2 1 34 12 11	2 1 13 7	1 45 10 5	2 16 10 10	1 54 11 2	2 28 11 8	11 6			
3 2 26 14 2	2 51 14 9	2 44 11 3	3 10 11 8	2 59 12 1	3 27 12 5	12 6	4 3 14 15 3	3 37 15 7	3 36 12 0	4 0 12 4	3 55 12 10	4 22 13 0	13 6	5 4 0 15 11	4 22 16 1	4 24 12 6	4 47 12 8	4 47 13 2	5 10 13 3	0	5 4 44 16 2	5 7 16 2	5 11 12 8	5 34 12 8	5 32 13 4	5 54 13 3	15 6			
7 5 30 15 11	5 53 15 7	5 57 12 6	6 19 12 3	6 16 13 2	6 39 13 0	16 6	6 6 14 15 2	6 35 14 8	6 40 12 0	7 0 11 8	7 1 12 9	7 21 12 6	17 6	6 6 57 14 1	7 19 13 6	7 21 11 3	7 41 10 11	7 40 12 3	8 0 11 11	18 6	6 7 43 12 11	8 8 12 3	8 2 10 6	8 23 10 1	8 20 11 6	8 40 11 1	19 6			
8 8 34 11 7	9 0 11 0	8 45 9 9	9 8 9 5	9 0 10 9	9 24 10 5	20 6	7 9 31 10 7	10 6 10 4	9 34 9 1	10 5 8 10	9 54 10 0	10 27 9 9	21	8 10 45 10 3	11 25 10 3	10 43 8 9	11 22 8 8	11 3 9 6	11 39 9 5	22 6	8 11 25 10 3	0 3 10 5	—	0 1 8 9	—	0 14 9 6	23 6			
9 0 35 10 8	1 6 11 1	0 36 9 0	1 10 9 2	0 47 9 8	1 19 9 11	24 6	9 1 34 11 5	1 56 11 10	1 43 9 5	2 9 9 8	1 52 10 2	2 19 10 5	25 6	9 2 16 12 3	2 35 12 7	2 31 9 11	2 53 10 3	2 44 10 9	3 8 11 0	26 6	9 2 54 12 11	3 11 13 3	3 12 10 6	3 31 10 9	3 30 11 3	3 50 11 6	27 6			
9 3 28 13 7	3 45 13 10	3 49 11 0	4 7 11 2	4 10 11 9	4 30 11 10	28 6	9 4 2 14 1	4 18 14 3	4 25 11 3	4 43 11 5	4 48 11 11	5 6 12 0	29	9 4 35 14 5	4 53 14 6	5 1 11 6	5 20 11 6	5 23 12 1	5 40 12 2	30 9										
Mean Spring Range.					7ft. 5in.					5ft 10in.					6ft. 2in.															

Mean Spring
Range.

7ft. 5in.

5ft 10in.

6ft. 2in.

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
10 29		9	12 49		17	14 41		25	15 53	
10 48		10	13 5		18	14 52		26	15 59	
11 6		11	13 20		19	15 3		27	16 4	
11 24		12	13 35		20	15 13		28	16 9	
11 42		13	13 49		21	15 22		29	16 12	
11 59		14	14 3		22	15 31		30	16 15	
12 16		15	14 16		23	15 39		31	16 17	
12 33		16	14 29		24	15 47				

es of High Water are given for Mean Time at Place; if Dublin or Railway Time be required, — for
 GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 8 m.

NOVEMBER, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.
Tu.	1	18 15	4 21 18 8	4 38 18 7	6 16 15 3	6 34 15 1	—	—	—	—	—	—	—	—
W.	2	2 8	4 55 18 5	5 13 18 3	6 49 15 2	7 5 14 9	0 38 12 4	0 55 12	0 38 12 4	0 55 12	0 38 12 4	0 55 12	0 38 12 4	0 55 12
Th.	3	3 2	5 32 18 0	5 52 17 8	7 23 14 11	7 42 14 4	1 14 12 2	1 33 12	1 14 12 2	1 33 12	1 14 12 2	1 33 12	1 14 12 2	1 33 12
F.	4	3 57	6 13 17 3	6 35 16 9	8 2 14 7	8 22 14 6	1 53 11 11	2 14 11	1 53 11 11	2 14 11	1 53 11 11	2 14 11	1 53 11 11	2 14 11
S.	5	4 51	7 1 16 2	7 29 15 8	8 43 14 1	9 9 13 3	2 36 11 7	3 1 11	2 36 11 7	3 1 11	2 36 11 7	3 1 11	2 36 11 7	3 1 11
S.	6	5 44	7 57 15 2	8 29 14 9	9 37 13 7	10 5 12 8	3 27 11 2	3 54 10	3 27 11 2	3 54 10	3 27 11 2	3 54 10	3 27 11 2	3 54 10
M.	7	6 37	9 5 14 7	9 42 14 8	10 37 13 2	11 15 12 5	4 25 10 9	4 59 10	4 25 10 9	4 59 10	4 25 10 9	4 59 10	4 25 10 9	4 59 10
Tu.	8	7 29	10 24 14 10	11 4 15 3	11 55 13 2	—	5 35 10 6	6 13 10	5 35 10 6	6 13 10	5 35 10 6	6 13 10	5 35 10 6	6 13 10
W.	9	8 21	11 41 15 8	—	0 37 12 9	1 17 13 9	6 52 10 9	7 28 11	1 17 13 9	6 52 10 9	7 28 11	7 28 11	6 52 10 9	7 28 11
Th.	10	9 14	0 14 16 3	0 45 16 11	1 54 13 7	2 27 14 6	8 4 11 5	8 36 11	2 27 14 6	8 4 11 5	8 36 11	8 36 11	8 4 11 5	8 36 11
F.	11	10 8	1 13 17 8	1 38 18 3	2 59 14 7	3 26 15 3	9 5 12 2	9 32 12	3 26 15 3	9 5 12 2	9 32 12	9 32 12	9 5 12 2	9 32 12
S.	12	11 4	2 3 18 10	2 26 19 4	3 53 15 2	4 20 15 7	9 58 12 8	10 22 12	4 20 15 7	9 58 12 8	10 22 12	10 22 12	9 58 12 8	10 22 12
S.	13	12 0	2 49 19 9	3 12 19 11	4 45 15 9	5 9 15 11	10 45 12 11	11 9 13	5 9 15 11	10 45 12 11	11 9 13	11 9 13	10 45 12 11	11 9 13
M.	14	morn.	3 35 19 11	3 58 19 10	5 32 15 11	5 55 15 11	11 31 13 1	11 54 13	5 55 15 11	11 31 13 1	11 54 13	11 54 13	11 31 13 1	11 54 13
Tu.	15	0 57	4 21 19 7	4 41 19 4	6 17 16 0	6 39 15 8	—	0 18 12	6 39 15 8	—	0 18 12	0 18 12	6 39 15 8	0 18 12
W.	16	1 53	5 1 18 11	5 21 18 6	6 58 15 8	7 15 15 1	0 41 12 9	1 2 12	7 15 15 1	0 41 12 9	1 2 12	1 2 12	7 15 15 1	1 2 12
Th.	17	2 46	5 41 18 0	6 3 17 6	7 33 15 3	7 52 14 4	1 23 12 4	1 43 12	7 52 14 4	1 23 12 4	1 43 12	1 43 12	7 52 14 4	1 43 12
F.	18	3 37	6 24 16 10	6 45 16 2	8 12 14 6	8 30 13 6	2 4 11 10	2 25 11	8 30 13 6	2 4 11 10	2 25 11	2 25 11	8 30 13 6	2 25 11
S.	19	4 25	7 7 15 7	7 30 14 11	8 48 13 9	9 8 12 8	2 46 11 4	3 8 11	9 8 12 8	2 46 11 4	3 8 11	3 8 11	9 8 12 8	3 8 11
S.	20	5 11	7 54 14 4	8 20 13 11	9 29 12 11	9 53 11 11	3 28 10 9	3 51 10	9 53 11 11	3 28 10 9	3 51 10	3 51 10	9 53 11 11	3 51 10
M.	21	5 54	8 46 13 7	9 19 13 5	10 19 12 4	10 47 11 6	4 16 10 3	4 43 10	10 47 11 6	4 16 10 3	4 43 10	4 43 10	10 47 11 6	4 43 10
Tu.	22	6 36	9 54 13 4	10 29 13 4	11 18 12 0	11 53 11 6	5 13 9 11	5 45 9	11 53 11 6	5 13 9 11	5 45 9	5 45 9	11 53 11 6	5 45 9
W.	23	7 18	11 4 13 7	11 38 13 10	—	0 28 12 2	6 18 9 9	6 53 9 11	0 28 12 2	6 18 9 9	6 53 9 11	6 53 9 11	0 28 12 2	6 53 9 11
Th.	24	8 0	—	0 9 14 2	1 3 12 1	1 37 12 9	7 25 10 1	7 57 10 4	1 37 12 9	7 25 10 1	7 57 10 4	7 57 10 4	1 37 12 9	7 57 10 4
F.	25	8 44	0 36 14 7	1 2 15 2	2 10 12 9	2 38 13 3	8 27 10 7	8 53 10 10	2 38 13 3	8 27 10 7	8 53 10 10	8 53 10 10	2 38 13 3	8 53 10 10
S.	26	9 29	1 25 15 7	1 46 16 2	3 4 13 5	3 28 13 9	9 17 11 2	9 40 11 5	3 28 13 9	9 17 11 2	9 40 11 5	9 40 11 5	3 28 13 9	9 40 11 5
S.	27	10 17	2 6 16 8	2 25 17 2	3 52 14 0	4 14 14 3	10 1 11 7	10 21 11 10	4 14 14 3	10 1 11 7	10 21 11 10	10 21 11 10	4 14 14 3	10 21 11 10
M.	28	11 7	2 44 17 8	3 4 18 1	4 36 14 7	4 57 14 8	10 40 12 0	10 59 12 1	4 57 14 8	10 40 12 0	10 59 12 1	10 59 12 1	4 57 14 8	10 59 12 1
Tu.	29	12 0	3 23 18 4	3 41 18 6	5 17 15 0	5 36 15 0	11 19 12 3	11 37 12 4	5 36 15 0	11 19 12 3	11 37 12 4	11 37 12 4	5 36 15 0	11 37 12 4
W.	30	08 55	4 2 18 8	4 22 18 9	5 56 15 4	6 16 15 1	11 58 12 5	—	6 16 15 1	11 58 12 5	—	—	6 16 15 1	11 58 12 5

Half Mean Spring } 9^{ft.} 6^{in.}
Range.7^{ft.} 9^{in.}6^{ft.} 4^{in.}

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
First Quarter-	6	11	53	Afternoon.
Full - - - - -	13	5	33	Afternoon.
Last Quarter -	21	7	17	Morning.
New - - - - -	29	7	17	Morning.
In Perigee - -	10	6	0	Afternoon.
In Apogee - -	22	1	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	18	3.27	9	0	8.3	17	18	N.11	25	9	8.13
2	19	30	10	4	N.46	18	16	5	26	12	41
3	19	30	11	9	21	19	13	18	27	15	39
4	18	25	12	13	21	20	10	0	28	17	56
5	16	17	13	16	31	21	6	21	29	19	19
6	13	11	14	18	37	22	2	29	30	19	39
7	9	18	15	19	35	23	1	8.30			
8	4	50	16	19	24	24	5	26			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 BREST add 18 m. DEVONPORT add 17 m. PORTSMOUTH add 4 m.

OCTOBER, 1864.

MONT. DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	D.								
1	4 32	14 4	4 46	14 6	4 57	11 6	5 13	11 7	5 20	12 1	5 34	12 2	0.6												
2	5 2	14 8	5 18	14 7	5 29	11 8	5 45	11 8	5 50	12 3	6 6	12 3	1.6												
3	5 35	14 6	5 51	14 5	6 2	11 7	6 18	11 6	6 22	12 3	6 38	12 2	2.6												
4	6 8	14 3	6 25	14 0	6 34	11 5	6 51	11 3	6 55	12 2	7 12	12 1	3.6												
5	6 43	13 8	7 2	13 4	7 8	11 0	7 26	10 9	7 28	11 11	7 45	11 9	4.6												
6	7 24	13 0	7 47	12 7	7 45	10 7	8 5	10 4	8 4	11 6	8 24	11 3	5.6												
7	8 12	12 1	8 39	11 7	8 26	10 0	8 51	9 9	8 44	11 0	9 5	10 9	6.6												
8	9 8	11 3	9 43	11 0	9 16	9 6	9 46	9 4	9 32	10 6	10 6	10 3	7.6												
9	10 23	10 11	11 8	11 0	10 22	9 2	11 6	9 3	10 44	10 1	11 25	10 0	8.6												
10	11 51	11 4	—	—	11 49	9 4	—	—	—	—	0 3	10 1	9.6												
11	0 30	11 9	1 4	12 4	0 30	9 7	1 8	10 0	0 41	10 4	1 18	10 9	10.6												
12	1 34	12 11	2 1	13 7	1 45	10 5	2 16	10 10	1 54	11 2	2 28	11 8	11.6												
1	2 26	14 2	2 51	14 9	2 44	11 3	3 10	11 8	2 59	12 1	3 27	12 5	12.6												
2	3 14	15 3	3 37	15 7	3 36	12 0	4 0	12 4	3 55	12 10	4 22	13 0	13.6												
3	4 0	15 11	4 22	16 1	4 24	12 6	4 47	12 8	4 47	13 2	5 10	13 3	14.6												
4	4 44	16 2	5 7	16 2	5 11	12 8	5 34	12 8	5 32	13 4	5 54	13 3	15.6												
5	5 30	15 11	5 53	15 7	5 57	12 6	6 19	12 3	6 16	13 2	6 39	13 0	16.6												
6	6 14	15 2	6 35	14 8	6 40	12 0	7 0	11 8	7 1	12 9	7 21	12 6	17.6												
7	6 57	14 1	7 19	13 6	7 21	11 3	7 41	10 11	7 40	12 3	8 0	11 11	18.6												
8	7 43	12 11	8 8	12 3	8 2	10 6	8 23	10 1	8 20	11 6	8 40	11 1	19.6												
9	8 34	11 7	9 0	11 0	8 45	9 9	9 8	9 5	9 0	10 9	9 24	10 5	20.6												
10	9 31	10 7	10 6	10 4	9 34	9 1	10 5	8 10	9 54	10 0	10 27	9 9	21.6												
11	10 45	10 3	11 25	10 3	10 43	8 9	11 22	8 8	11 3	9 6	11 39	9 5	22.6												
12	—	—	0 3	10 5	—	—	0 1	8 9	—	—	0 14	9 6	23.6												
1	0 35	10 8	1 6	11 1	0 36	9 0	1 10	9 2	0 47	9 8	1 19	9 11	24.6												
2	1 34	11 5	1 56	11 10	1 43	9 5	2 9	9 8	1 52	10 2	2 19	10 5	25.6												
3	2 16	12 3	2 35	12 7	2 31	9 11	2 53	10 3	2 44	10 9	3 8	11 0	26.6												
4	2 54	12 11	3 11	13 3	3 12	10 6	3 31	10 9	3 30	11 3	3 50	11 6	27.6												
5	3 28	13 7	3 45	13 10	3 49	11 0	4 7	11 2	4 10	11 9	4 30	11 10	28.6												
6	4 2	14 1	4 18	14 3	4 25	11 3	4 43	11 5	4 48	11 11	5 6	12 0	29.6												
7	4 35	14 5	4 53	14 6	5 1	11 6	5 20	11 6	5 23	12 1	5 40	12 2	30.6												
Mean Spring Range.				7ft. 5in.	5ft. 10in.				6ft. 2in.																

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
10 29		9	12 49		17	14 41		25	15 53	
10 48		10	13 5		18	14 52		26	15 59	
11 6		11	13 20		19	15 3		27	16 4	
11 24		12	13 35		20	15 13		28	16 9	
11 42		13	13 49		21	15 22		29	16 12	
11 59		14	14 3		22	15 31		30	16 15	
12 16		15	14 16		23	15 39		31	16 17	
12 33		16	14 29		24	15 47				

Times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
 GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.
 F

NOVEMBER, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.							
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTER					
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.				
		H. M.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.				
Tu.	1	12 15	0 30	11 5	0 48	11 5	7 7	20 6	7 26	20 6	3 57	14 2	4 15					
W.	2	2 8	1 6	11 4	1 24	11 3	7 43	20 5	7 59	20 4	4 33	14 1	4 49					
Th.	3	3 2	1 41	11 2	2 0	11 1	8 18	20 2	8 37	19 10	5 8	13 9	5 28					
F.	4	3 57	2 20	11 0	2 40	10 10	8 58	19 6	9 19	19 1	5 49	13 3	6 11					
S.	5	4 51	3 1	10 8	3 22	10 6	9 40	18 9	10 7	18 3	6 35	12 8	7 3					
S.	6	5 44	3 47	10 4	4 13	10 3	10 37	17 11	11 11	17 6	7 31	12 1	8 2					
M.	7	6 37	4 43	10 1	5 15	10 0	11 49	17 3	—	—	8 36	11 8	9 15					
Tu.	8	7 29	5 51	10 0	6 30	10 0	0 29	17 0	1 4	17 1	9 54	11 6	10 32					
W.	9	8 21	7 13	10 2	7 51	10 4	1 40	17 3	2 15	17 9	11 8	11 11	11 40					
Th.	10	9 14	8 26	10 7	8 58	10 10	2 48	18 4	3 19	19 0	—	—	0 10					
F.	11	10 8	9 28	11 1	9 57	11 4	3 49	19 7	4 16	20 2	0 39	13 2	1 6					
S.	12	11 4	10 22	11 6	10 47	11 9	4 40	20 7	5 4	21 0	1 33	13 11	1 59					
S.	13	12 0	11 12	11 11	11 36	12 0	5 27	21 3	5 52	21 5	2 24	14 6	2 47					
M.	14	morn.	11 59	12 0	—	—	6 17	21 7	6 39	21 7	3 9	14 11	3 31					
Tu.	15	0 57	0 20	11 11	0 42	11 10	7 1	21 6	7 24	21 4	3 53	14 10	4 15					
W.	16	1 53	1 5	11 9	1 27	11 7	7 46	21 1	8 6	20 9	4 36	14 7	4 56					
Th.	17	2 46	1 47	11 4	2 8	11 2	8 26	20 4	8 46	19 10	5 16	13 11	5 37					
F.	18	3 37	2 29	11 0	2 51	10 9	9 8	19 4	9 30	18 9	6 0	13 1	6 23					
S.	19	4 25	3 12	10 6	3 33	10 4	9 51	18 3	10 14	17 9	6 47	12 4	7 10					
S.	20	5 11	3 54	10 2	4 16	9 11	10 39	17 3	11 8	16 10	7 34	11 8	7 59					
M.	21	5 54	4 40	9 9	5 5	9 8	11 39	16 5	—	—	8 27	11 1	8 56					
Tu.	22	6 36	5 32	9 7	6 5	9 6	0 11	16 1	0 43	16 0	9 30	10 9	10 51					
W.	23	7 18	6 43	9 6	7 18	9 7	1 14	15 11	1 45	16 0	10 37	10 9	11 9					
Th.	24	8 0	7 52	9 9	8 23	9 11	2 16	16 3	2 45	16 8	11 38	11 1	—					
F.	25	8 44	8 53	10 0	9 19	10 2	3 14	17 1	3 41	17 6	0 6	11 5	0 31					
S.	26	9 29	9 45	10 5	10 8	10 7	4 5	18 0	4 28	18 5	0 55	12 0	1 18					
S.	27	10 17	10 30	10 9	10 50	10 11	4 48	18 10	5 7	19 2	1 41	12 8	2 21					
M.	28	11 7	11 10	11 1	11 30	11 3	5 26	19 6	5 46	19 9	2 22	13 2	2 42					
Tu.	29	12 0	11 50	11 4	—	—	6 6	20 0	6 26	20 2	3 1	13 7	3 19					
W.	30	0 55	0 10	11 5	0 27	11 5	6 45	20 4	7 5	20 6	3 38	14 0	3 57					
Half Mean Spring } Range.			5 ft. 9 in.				10 ft. 5 in.				7 ft. 2 in.							
Phases of the Moon.							Moon's Declination at Noon.											
D. H. M.							M.D.		° ' "		M.D.		° ' "		M.D.		° ' "	
First Quarter 6 11 53 Afternoon.							1		18 27		9		0 8. 3		17		18 N. 11	
Full - - - 13 5 33 Afternoon.							2		19 30		10		4 N. 46		18		16 5	
Last Quarter 21 7 17 Morning.							3		19 30		11		9 21		19		13 18	
New - - - 29 7 17 Morning.							4		18 25		12		13 21		20		10 0	
							5		16 17		13		16 31		21		6 21	
In Perigee - 10 6 0 Afternoon.							6		13 11		14		18 37		22		2 29	
In Apogee - 23 1 0 Afternoon.							7		9 18		15		19 35		23		18. 30	
							8		4 50		16		19 24		24		5 26	

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 5 m.

NOVEMBER, 1864.

DOVER.					SHEERNESS.					LONDON.					C's AGE AT NOON.
MORNING.			AFTERNOON.		MORNING.			AFTERNOON.		MORNING.			AFTERNOON.		
Time. H. M. P.	Height. F. L.		Time. H. M. P.	Height. F. L.	Time. H. M. P.	Height. F. L.		Time. H. M. P.	Height. F. L.	Time. H. M. P.	Height. F. L.		Time. H. M. P.	Height. F. L.	
53 18	4		—	—	1 17 15	11		1 35 15	11	2 47 18	10		3 3 18	11	1'9
12 18	4		0 31 18	3	1 52 15	10		2 9 15	9	3 21 18	11		3 38 18	11	2'9
51 18	1		1 12 17	11	2 25 15	8		2 43 15	7	3 56 18	10		4 14 18	9	3'9
33 17	9		1 54 17	6	3 2 15	5		3 22 15	2	4 34 18	6		4 52 18	4	4'9
17 17	1		2 42 16	9	3 43 14	11		4 5 14	8	5 14 18	1		5 37 17	10	5'9
8 16	4		3 35 15	11	4 31 14	4		4 59 14	1	6 1 17	6		6 30 17	2	D
4 15	7		4 36 15	3	5 30 13	10		6 4 13	7	6 58 16	11		7 31 16	8	7'9
8 15	2		5 43 15	3	6 44 13	6		7 24 13	7	8 10 16	6		8 51 16	6	8'9
18 15	7		6 54 16	1	8 5 13	9		8 43 14	1	9 31 16	7		10 8 16	9	9'9
29 16	8		8 1 17	2	9 19 14	5		9 51 14	10	10 46 17	0		11 20 17	4	10'9
28 17	8		8 55 18	2	10 20 15	3		10 47 15	7	11 49 17	9		—	—	11'9
21 18	7		9 47 18	11	11 11 15	10		11 35 16	2	0 16 18	2		0 41 18	6	12'9
13 19	1		10 38 19	3	11 59 16	4		—	—	1 7 18	10		1 30 19	2	O
4 19	4		11 28 19	3	0 22 16	6		0 46 16	7	1 54 19	4		2 17 19	6	14'9
52 19	1		—	—	1 8 16	8		1 30 16	6	2 38 19	7		3 0 19	7	15'9
15 18	11		0 37 18	8	1 52 16	5		2 13 16	3	3 21 19	6		3 42 19	4	16'9
0 18	4		1 22 18	0	2 32 16	0		2 51 15	9	4 2 19	11		4 23 18	11	17'9
44 17	7		2 6 17	2	3 11 15	5		3 32 15	1	4 42 18	7		5 3 18	3	18'9
28 16	8		2 49 16	2	3 54 14	9		4 16 14	4	5 25 17	10		5 47 17	6	19'9
10 15	9		3 32 15	3	4 38 14	0		5 2 13	8	6 9 17	1		6 31 16	9	20'9
56 14	10		4 20 14	6	5 27 13	4		5 55 13	1	6 54 16	5		7 21 16	2	C
48 14	3		5 17 14	1	6 25 12	11		6 59 12	10	7 52 15	11		8 28 15	9	22'9
48 14	0		6 19 14	3	7 36 12	10		8 10 12	11	9 1 15	8		9 34 15	7	23'9
51 14	7		7 23 14	11	8 44 13	2		9 16 13	4	10 7 15	9		10 38 15	10	24'9
52 15	3		8 17 15	8	9 46 13	7		10 12 13	11	11 12 16	0		11 40 16	4	25'9
3 40 16	1		9 3 16	6	10 36 14	2		10 59 14	5	—	—		0 6 16	7	26'9
24 16	10		9 45 17	2	11 19 14	9		11 39 15	0	0 28 16	11		0 50 17	3	27'9
6 17	6		10 27 17	9	11 58 15	2		—	—	1 9 17	6		1 28 17	10	28'9
49 18	0		11 10 18	2	0 17 15	5		0 36 15	7	1 48 18	1		2 6 18	4	●
1 31 18	4		11 53 18	4	0 56 15	9		1 13 15	10	2 27 18	7		2 46 18	9	1'2
Mean Spring Tide.			9ft. 4in.		8ft. 0in.			9ft. 7in.							

Equation of Time at Noon.

M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
6 18		9	15 59		17	14 47		25	12 41	
6 19		10	15 53		18	14 34		26	12 22	
6 18		11	15 46		19	14 20		27	12 2	
6 17		12	15 38		20	14 6		28	11 41	
6 15		13	15 30		21	13 50		29	11 20	
6 12		14	15 20		22	13 34		30	10 58	
6 9		15	15 10		23	13 17				
6 4		16	14 59		24	13 0				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 Dover subtract 3 m. SHEERNESS subtract 3 m. LONDON 6 m.

NOVEMBER, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.								
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.											
		H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.												
Tu.	1	18 15	0 27 9 7	0 46 9 7	11 57 25 6	—	—	6 47 20 7	7 4 20 6																						
W.	2	2 8	1 4 9 7	1 21 9 7	0 15 25 5	0 32 25 4	7 20 20 4	7 40 20 2																							
Th.	3	3 2	1 39 9 6	1 58 9 5	0 50 25 1	1 9 24 8	8 0 19 11	8 20 19 7																							
F.	4	3 57	2 19 9 5	2 39 9 4	1 28 24 3	1 49 23 9	8 41 19 2	9 2 18 8																							
S.	5	4 51	3 0 9 2	3 24 9 1	2 10 23 3	2 35 22 9	9 25 18 3	9 49 17 10																							
S.	6	5 44	3 51 9 0	4 19 8 10	3 22 3 3	3 30 21 8	10 15 17 4	10 41 16 10																							
M.	7	6 37	4 49 8 9	5 24 8 7	4 42 1 3	4 43 21 0	11 12 16 6	11 44 16 6																							
Tu.	8	7 29	6 1 8 6	6 39 8 6	5 23 21 1	6 8 21 5	—	0 20 16 7																							
W.	9	8 21	7 17 8 8	7 53 8 10	6 47 21 11	7 22 22 6	1 2 16 11	1 42 17 5																							
Th.	10	9 14	8 26 9 0	8 58 9 3	7 55 23 3	8 23 24 0	2 19 18 1	2 53 18 10																							
F.	11	10 8	9 26 9 5	9 53 9 6	8 49 24 9	9 13 25 4	3 23 19 7	3 52 20 2																							
S.	12	11 4	10 19 9 8	10 45 9 9	9 37 25 11	10 0 26 4	4 21 20 9	4 48 21 2																							
S.	13	12 0	11 10 9 10	11 35 9 11	10 24 26 6	10 48 26 9	5 15 21 5	5 40 21 8																							
M.	14	morn.	11 59 9 11	—	11 11 26 10	11 33 26 9	6 22 21 9	6 24 21 9																							
Tu.	15	0 57	0 22 9 11	0 45 9 11	11 56 26 7	—	6 46 21 7	7 7 21 3																							
W.	16	1 53	1 7 9 10	1 28 9 9	0 18 26 4	0 38 25 11	7 27 20 10	7 48 20 5																							
Th.	17	2 46	1 48 9 8	2 8 9 6	0 58 25 4	1 18 24 8	8 9 19 11	8 31 19 4																							
F.	18	3 37	2 29 9 4	2 49 9 2	1 39 24 1	2 0 23 4	8 52 18 9	9 12 18 2																							
S.	19	4 25	3 10 9 0	3 31 8 11	2 21 22 8	2 42 22 1	9 31 17 7	9 50 17 1																							
M.	20	5 11	3 53 8 9	4 16 8 7	3 42 21 4	3 27 20 9	10 12 16 6	10 34 16 0																							
M.	21	5 54	4 40 8 6	5 7 8 4	3 55 20 3	4 24 19 10	10 56 15 6	11 24 15 3																							
Tu.	22	6 36	5 39 8 3	6 12 8 1	4 59 19 8	5 36 19 7	11 54 15 1	—																							
W.	23	7 18	6 45 8 0	7 18 8 1	6 13 19 8	6 48 20 0	0 26 15 1	1 2 15 3																							
Th.	24	8 0	7 50 8 3	8 21 8 4	7 19 20 4	7 49 20 10	1 39 15 6	2 12 15 11																							
F.	25	8 44	8 49 8 6	9 15 8 7	8 16 21 4	8 39 21 11	2 42 16 5	3 10 16 12																							
S.	26	9 29	9 38 8 9	10 1 8 11	9 12 22 6	9 21 23 0	3 35 17 6	4 0 18 1																							
S.	27	10 17	10 22 9 0	10 42 9 1	9 41 23 6	9 59 24 0	4 23 18 7	4 46 19 0																							
M.	28	11 7	11 3 9 2	11 24 9 3	10 18 24 4	10 38 24 8	5 8 19 5	5 29 19 9																							
Tu.	29	12 0	11 45 9 5	—	10 58 25 0	11 17 25 3	5 50 20 1	6 9 20 4																							
W.	30	08 55	0 5 9 6	0 25 9 7	11 37 25 6	11 57 25 7	6 28 20 7	6 49 20 8																							
Half Mean Spring Range.			4 ft. 10 in.								13 ft. 0 in.								10 ft. 6 in.												
Phases of the Moon.																Moon's Declination at Noon.															
D H M.																M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'				
First Quarter - 6 11 53 Afternoon.																1	18	3.27	9	08.	3	17	18	N.11	25	9.13					
Full - - - - - 13 5 33 Afternoon.																2	19	30	10	4	N.46	18	16	5	26	12 41					
Last Quarter - 21 7 17 Morning.																3	19	30	11	9	21	19	13	18	27	15 39					
New - - - - - 29 7 17 Morning.																4	18	25	12	13	21	20	10	0	28	17 50					
																5	16	17	13	16	31	21	6	21	29	19 19					
In Perigee - - 10 6 0 Afternoon.																6	13	11	14	18	37	22	2	29	30	19 39					
In Apogee - - 22 1 0 Afternoon.																7	9	18	15	19	35	23	18.	30							
																8	4	50	16	19	24	24	5	26							

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

NOVEMBER, 1864.

M. D.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.													
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.															
		Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.														
1	3	59	13	0	4	17	12	11	2	55	16	0	3	12	15	11	9	1	12	11	9	19	12	10	1	9	
2	4	35	12	10	4	52	12	8	3	30	15	10	3	47	15	8	9	37	12	8	9	56	12	6	2	9	
3	5	11	12	6	5	32	12	4	4	6	15	6	4	27	15	3	10	17	12	3	10	38	11	11	3	9	
4	5	53	12	2	6	14	11	11	4	47	15	1	5	9	14	10	11	1	11	7	11	25	11	4	4	9	
5	6	37	11	8	7	5	11	4	5	33	14	6	6	1	14	2	11	53	11	0	—	—	—	—	—	5	9
6	7	35	11	0	8	8	10	8	6	30	13	10	7	3	13	6	0	22	10	8	0	54	10	5	—	—	
7	8	45	10	5	9	26	10	4	7	39	13	3	8	19	13	1	1	30	10	2	2	10	10	1	7	9	
8	10	6	10	6	10	44	10	8	8	59	13	2	9	39	13	4	2	52	10	1	3	37	10	2	8	9	
9	11	21	11	0	11	54	11	4	10	14	13	8	10	47	14	0	4	14	10	5	4	49	10	8	9	9	
10	—	—	—	—	0	23	11	8	11	17	14	5	11	45	14	10	5	19	11	1	5	47	11	6	10	9	
11	0	51	12	0	1	15	12	5	—	—	—	—	0	9	15	3	6	10	12	1	6	31	12	7	11	9	
12	1	39	12	9	2	3	13	1	0	33	15	8	0	58	16	2	6	52	13	0	7	13	13	5	12	9	
13	2	25	13	4	2	47	13	7	1	22	16	6	1	45	16	9	7	34	13	9	7	56	13	11	—	—	
14	3	9	13	8	3	31	13	9	2	8	16	11	2	29	16	11	8	17	13	11	8	38	13	9	14	9	
15	3	53	13	9	4	16	13	7	2	50	16	10	3	11	16	7	9	0	13	7	9	22	13	4	15	9	
16	4	38	13	3	4	59	12	11	3	32	16	4	3	53	16	0	9	43	13	0	10	5	12	8	16	9	
17	5	20	12	8	5	41	12	4	4	15	15	8	4	36	15	4	10	26	12	2	10	49	11	9	17	9	
18	6	3	12	0	6	25	11	8	4	58	14	11	5	21	14	7	11	13	11	4	11	37	10	11	18	9	
19	6	48	11	4	7	12	10	11	5	45	14	2	6	9	13	8	12	0	10	6	—	—	—	—	—	19	9
20	7	38	10	6	8	5	10	2	6	33	13	3	7	0	12	11	0	25	10	2	0	51	9	10	20	9	
21	8	35	9	11	9	6	9	9	7	30	12	8	8	0	12	5	1	20	9	7	1	51	9	4	—	—	
22	9	43	9	8	10	17	9	8	8	35	12	4	9	11	12	3	2	27	9	3	3	5	9	2	22	9	
23	10	50	9	9	11	22	9	11	9	44	12	4	10	15	12	6	3	42	9	2	4	15	9	3	23	9	
24	11	52	10	2	—	—	—	—	10	45	12	8	11	13	12	11	4	46	9	5	5	15	9	7	24	9	
25	0	20	10	4	0	44	10	7	11	37	13	3	—	—	—	—	5	40	9	11	6	3	10	3	25	9	
26	1	7	10	10	1	28	11	2	0	1	13	6	0	22	13	11	6	23	10	8	6	41	11	1	26	9	
27	1	47	11	5	2	6	11	9	0	42	14	3	1	1	14	8	6	58	11	6	7	14	11	11	27	9	
28	2	25	12	0	2	43	12	3	1	21	15	0	1	40	15	4	7	31	12	3	7	47	12	7	28	9	
29	3	1	12	6	3	20	12	9	1	59	15	7	2	19	15	10	8	6	12	10	8	23	12	11	—	—	
30	3	37	12	10	3	57	12	11	2	36	15	11	2	54	16	0	8	42	13	0	9	2	13	0	1	2	
Half Mean Spring Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.																	

Equation of Time at Noon.

M. D.	M.	S.	Add.	M. D.	M.	S.	Add.	M. D.	M.	S.	Add.	M. D.	M.	S.	Add.
1	16	18	Add.	9	15	59	Add.	17	14	47	Add.	25	12	41	Add.
2	16	19		10	15	53		18	14	34		26	12	23	
3	16	18		11	15	46		19	14	20		27	12	2	
4	16	17		12	15	38		20	14	6		28	11	41	
5	16	15		13	15	30		21	13	50		29	11	20	
6	16	12		14	15	23		22	13	34		30	10	58	
7	16	9		15	15	10		23	13	17					
8	16	4		16	14	59		24	13	0					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

NOVEMBER, 1864.

WEEK DAY.		MONTH DAY.		MOON'S TRANSIT.		BELFAST.								LONDONDERRY.								SLIGO BAY.							
						MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
						Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.	
						H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
Tu.	1	18	15	11	21	9	4	11	38	9	3	8	33	7	6	8	49	7	5	5	51	11	0	6	8				
W.	2	2	8	11	56	9	3					9	5	7	4	9	23	7	2	6	26	10	9	6	45				
Th.	3	3	2	0	16	9	3	0	37	9	2	9	41	7	1	10	1	6	11	7	5	10	4	7	25				
F.	4	3	57	0	59	9	1	1	22	9	0	10	22	6	9	10	47	6	6	7	45	9	9	8	8				
S.	5	4	51	1	48	8	10	2	17	8	9	11	19	6	4	11	54	6	1	8	36	9	3	9	8				
S.	6	5	44	2	46	8	7	3	17	8	5					0	34	5	11	9	42	8	10	10	20				
M.	7	6	37	3	51	8	4	4	30	8	4	1	16	5	10	2	3	5	10	11	1	8	8	11	39				
Tu.	8	7	29	5	6	8	4	5	42	8	4	2	43	6	0	3	20	6	3					0	16				
W.	9	8	21	6	19	8	4	6	54	8	5	3	52	6	6	4	19	6	9	0	53	9	1	1	27				
Th.	10	9	14	7	25	8	7	7	53	8	10	4	44	7	0	5	7	7	2	1	58	9	8	2	25				
F.	11	10	8	8	18	9	1	8	43	9	3	5	30	7	5	5	53	7	7	2	49	10	4	3	12				
S.	12	11	4	9	7	9	5	9	31	9	7	6	18	7	9	6	43	7	10	3	34	11	0	3	57				
S.	13	12	0	9	54	9	8	10	17	9	8	7	7	7	11	7	30	8	0	4	20	11	5	4	44				
M.	14	morn		10	39	9	8	11	0	9	8	7	52	8	0	8	13	8	0	5	8	11	8	5	30				
Tu.	15	0	57	11	21	9	7	11	42	9	6	8	33	7	11	8	53	7	9	5	51	11	6	6	11				
W.	16	1	53					0	3	9	5	9	12	7	6	9	31	7	3	6	32	11	0	6	53				
Th.	17	2	46	0	25	9	3	0	47	9	2	9	50	7	0	10	11	6	10	7	14	10	3	7	36				
F.	18	3	37	1	11	9	0	1	34	8	11	10	33	6	7	10	59	6	4	7	57	9	7	8	19				
S.	19	4	25	1	59	8	9	2	23	8	7	11	27	6	0	11	57	5	9	8	43	9	0	9	10				
S.	20	5	11	2	48	8	5	3	14	8	3					0	30	5	7	9	39	8	5	10	10				
M.	21	5	54	3	42	8	2	4	11	8	1	1	5	5	6	1	42	5	5	10	42	8	2	11	16				
Tu.	22	6	36	4	44	8	0	5	16	7	11	1	20	5	5	2	54	5	7	11	49	8	2						
W.	23	7	18	5	48	7	11	6	20	7	11	3	25	5	9	3	53	5	11	0	21	8	2	0	54				
Th.	24	8	0	6	51	8	0	7	21	8	1	4	19	6	1	4	43	6	2	1	24	8	5	1	53				
F.	25	8	44	7	46	8	2	8	9	8	4	5	3	6	4	5	23	6	6	2	19	8	10	2	41				
S.	26	9	29	8	31	8	7	8	51	8	9	5	42	6	7	6	1	6	9	3	2	9	4	3	21				
S.	27	10	17	9	11	8	11	9	30	9	0	6	21	6	11	6	41	7	1	3	38	9	11	3	56				
M.	28	11	7	9	49	9	2	10	8	9	3	7	1	7	2	7	21	7	3	4	15	10	5	4	34				
Tu.	29	12	0	10	27	9	3	10	45	9	4	7	41	7	5	7	58	7	6	4	54	10	10	5	14				
W.	30	08	55	11	4	9	4	11	23	9	4	8	17	7	7	8	35	7	8	5	34	11	0	5	53				
Half Mean Spring } Range.						4 ft. 9 in.						3 ft. 10 in.						5 ft. 7 in.											
Phases of the Moon.														Moon's Declination at Noon.															
D. H. M.														M.D. ° ' "															
First Quarter 6 11 53 Afternoon.														1 18 27 9 0 8. 3 17 18 N. 11 25 9															
Full - - - - 13 5 33 Afternoon.														2 19 30 10 4 N. 46 18 16 5 20 12															
Last Quarter - 21 7 17 Morning.														3 19 30 11 9 21 19 13 18 17 15															
New - - - - 29 7 17 Morning.														4 18 25 12 13 21 20 10 0 28 17															
														5 16 17 13 16 31 21 6 21 29 19															
In Perigee - - 10 6 0 Afternoon.														6 13 11 14 18 37 22 2 29 30 19															
In Apogee - - 22 1 0 Afternoon.														7 9 18 15 19 35 23 18.30 23 18.30															
														8 4 50 16 19 24 24 5 26															

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required
 BELFAST subtract 3 m. LONDONDERRY add 4 m. SLIGO BAY add 3 m.

NOVEMBER, 1864.

GALWAY.												QUEENSTOWN.												WATERFORD.												C's Age at Noon.
MORNING.						AFTERNOON.						MORNING.						AFTERNOON.						MORNING.						AFTERNOON.						
Time.	Height.					Time.	Height.					Time.	Height.					Time.	Height.					Time.	Height.					Time.	Height.					D.
H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.
5 11	14	6				5 29	14	5				5 38	11	6				5 56	11	6				5 59	12	2				6 17	12	2				1'9
5 47	14	4				6 6	14	2				6 13	11	5				6 32	11	4				6 34	12	2				6 53	12	1				2'9
5 26	13	11				6 47	13	8				6 51	11	2				7 11	11	0				7 12	12	0				7 32	11	11				3'9
7 8	13	4				7 32	13	0				7 32	10	9				7 53	10	7				7 51	11	9				8 11	11	7				4'9
7 59	12	7				8 27	12	2				8 15	10	4				8 40	10	1				8 33	11	4				8 55	11	1				5'9
8 57	11	9				9 30	11	6				9 7	9	10				9 35	9	8				9 21	10	11				9 53	10	8				6
9 8	11	5				10 47	11	6				10 9	9	7				10 46	9	7				10 31	10	5				11 7	10	4				7'9
10 28	11	9				—	—					11 25	9	8				—	—					11 42	10	4				—	—					8'9
10 5	12	0				0 39	12	5				0 3	9	10				0 40	10	1				0 16	10	7				0 50	10	10				9'9
10 9	12	10				1 37	13	4				1 16	10	4				1 49	10	8				1 24	11	1				1 58	11	5				10'9
10 3	13	9				2 28	14	2				2 18	11	0				2 46	11	3				2 31	11	9				3 1	12	0				11'9
10 53	14	7				3 17	14	10				3 13	11	7				3 38	11	9				3 31	12	4				3 59	12	6				12'9
10 40	15	1				4 3	15	3				4 3	11	11				4 28	12	1				4 26	12	8				4 51	12	9				13'9
10 25	15	4				4 47	15	4				4 51	12	2				5 14	12	1				5 13	12	9				5 35	12	9				14'9
10 10	15	3				5 33	15	0				5 37	12	0				6 0	11	11				5 58	12	8				6 20	12	7				15'9
10 54	14	8				6 14	14	4				6 20	11	9				6 40	11	6				6 41	12	5				7 1	12	3				16'9
10 35	13	11				6 57	13	6				7 0	11	2				7 21	10	11				7 21	12	1				7 41	11	10				17'9
10 20	13	1				7 43	12	7				7 42	10	7				8 2	10	4				8 1	11	7				8 21	11	4				18'9
10 6	12	1				8 30	11	7				8 21	10	0				8 42	9	9				8 39	11	0				8 57	10	9				19'9
10 55	11	2				9 21	10	10				9 4	9	6				9 26	9	3				9 18	10	6				9 44	10	3				20'9
10 50	10	7				10 24	10	6				9 51	9	1				10 23	9	0				10 13	10	9				10 45	9	10				21'9
10 59	10	6				11 33	10	7				10 56	8	11				11 30	8	11				11 16	9	8				11 47	9	7				22'9
—	—	—				0 6	10	9				—	—					0 4	9	0				—	—					0 17	9	9				23'9
10 36	11	0				1 5	11	3				0 36	9	2				1 8	9	4				0 47	9	10				1 17	10	0				24'9
10 30	11	7				1 52	11	11				1 39	9	6				2 6	9	9				1 47	10	3				2 16	10	6				25'9
10 14	12	3				2 36	12	8				2 30	10	0				2 54	10	3				2 43	10	9				3 9	11	0				26'9
10 57	12	11				3 16	13	3				3 15	10	6				3 36	10	9				3 33	11	3				3 56	11	6				27'9
10 35	13	6				3 54	13	10				3 57	10	11				4 17	11	1				4 18	11	8				4 40	11	10				28'9
10 14	14	1				4 31	14	3				4 37	11	3				4 57	11	5				5 1	11	11				5 19	12	1				29'9
10 51	14	5				5 12	14	7				5 18	11	6				5 39	11	7				5 39	12	2				6 0	12	3				30'9

an Spring } 7ft. 5in.
gc.

5ft. 10in.

6ft. 2in.

Equation of Time at Noon.

M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
6 18	Add.	9	15 59	Add.	17	14 47	Add.	25	12 41	Add.
6 19		10	15 53		18	14 34		26	12 22	
6 18		11	15 46		19	14 20		27	12 2	
6 17		12	15 38		20	14 6		28	11 41	
6 15		13	15 30		21	13 50		29	11 20	
6 12		14	15 20		22	13 34		30	10 58	
6 9		15	15 10		23	13 17				
6 4		16	14 59		24	13 0				

of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

DECEMBER, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
Th.	1	12 51	4 41	18 9	5 11	18 9	6 30	15 6	6 55	15 0	0 20	12 5	0 40	1
F.	2	2 47	5 22	18 7	5 43	18 5	7 14	15 5	7 35	14 10	1 0	12 5	1 22	1
S.	3	3 41	6 5	18 2	6 29	17 9	7 56	15 3	8 17	14 5	1 43	12 4	2 6	1
M.	4	4 34	6 54	17 4	7 20	16 10	8 40	14 10	9 4	13 11	2 31	12 1	2 55	1
Tu.	5	5 26	7 47	16 4	8 15	15 11	9 28	14 3	9 56	13 11	3 20	11 9	3 45	1
W.	6	6 17	8 46	15 6	9 17	15 4	10 24	13 9	10 55	13 0	4 12	11 4	4 41	1
Th.	7	7 8	9 52	15 3	10 28	15 3	11 28	13 4	—	—	5 11	10 11	5 45	1
F.	8	8 0	11 7	15 5	11 44	15 8	0 6	13 0	0 45	13 6	6 19	10 9	6 55	1
S.	9	8 53	—	—	0 19	16 0	1 23	13 5	1 58	13 10	7 31	11 1	8 8	1
M.	10	9 48	0 50	16 5	1 19	16 11	2 32	14 0	3 2	14 3	8 41	11 7	9 11	1
Tu.	11	10 43	1 46	17 5	2 12	17 11	3 32	14 6	4 1	14 9	9 40	12 0	10 7	1
W.	12	11 39	2 37	18 4	3 0	18 7	4 27	15 0	4 53	15 1	10 33	12 4	10 56	1
Th.	13	morn.	3 23	18 9	3 45	18 10	5 16	15 5	5 39	15 2	11 19	12 6	11 41	1
F.	14	0 33	4 8	18 9	4 29	18 8	6 2	15 7	6 22	15 2	—	—	0 4	1
S.	15	1 26	4 48	18 7	5 7	18 4	6 42	15 7	6 59	14 11	0 26	12 5	0 46	1
M.	16	2 16	5 25	18 0	5 43	17 9	7 17	15 3	7 34	14 5	1 7	12 3	1 26	1
Tu.	17	3 3	6 3	17 5	6 21	17 0	7 52	14 9	8 10	13 10	1 44	12 0	2 3	1
W.	18	3 48	6 41	16 6	7 0	16 1	8 26	14 2	8 41	13 2	2 22	11 8	2 42	1
Th.	19	4 31	7 20	15 7	7 42	15 1	8 58	13 5	9 17	12 7	3 1	11 3	3 20	1
F.	20	5 13	8 2	14 7	8 23	14 2	9 37	12 9	9 56	12 0	3 40	10 11	4 0	1
S.	21	5 55	8 47	13 10	9 15	13 7	10 20	12 3	10 45	11 9	4 20	10 5	4 43	1
M.	22	6 37	9 48	13 6	10 22	13 6	11 13	11 11	11 47	11 9	5 10	10 0	5 41	1
Tu.	23	7 21	10 57	13 6	11 33	13 8	—	—	0 22	11 11	6 13	9 10	6 46	1
W.	24	8 7	—	—	0 8	14 0	0 58	12 1	1 34	12 4	7 21	10 0	7 55	1
Th.	25	8 56	0 38	14 5	1 6	14 11	2 8	12 7	2 39	12 10	8 28	10 6	8 57	1
F.	26	9 48	1 33	15 6	1 57	16 2	3 10	13 3	3 38	13 7	9 24	11 1	9 50	1
S.	27	10 43	2 20	16 9	2 41	17 5	4 4	14 2	4 29	14 4	10 15	11 8	10 37	1
M.	28	11 39	3 3	18 0	3 25	18 6	4 53	14 11	5 17	14 9	10 59	12 2	11 21	1
Tu.	29	0 36	3 46	18 11	4 8	19 2	5 40	15 6	6 3	15 11	11 42	12 6	—	1
W.	30	1 33	4 30	19 5	4 52	19 7	6 25	15 10	6 47	15 5	0 4	12 8	0 27	1
Th.	31	2 28	5 14	19 7	5 35	19 6	7 8	16 1	7 29	15 5	0 50	12 10	1 13	1

Half Mean Spring } 9 ft. 6 in.
Range.

7 ft. 9 in.

6 ft. 4 in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
First Quarter	6	7	34	Morning.
Full	13	7	12	Morning.
Last Quarter	21	5	3	Morning.
New	28	9	21	Afternoon.
In Perigee	6	10	0	Afternoon.
In Apogee	20	9	0	Morning.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	18	S. 52	9	12	N. 4	17	11	N. 23	25	1	
2	16	58	10	15	28	18	7	49	26	1	
3	14	3	11	17	57	19	3	59	27	1	
4	10	19	12	19	22	20	0	2	28	1	
5	5	59	13	19	39	21	3	S. 55	29	1	
6	1	20	14	18	51	22	7	45	30	1	
7	3	N. 25	15	17	5	23	11	20	31	1	
8	7	58	16	14	32	24	14	30			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 BREST add 18 m. DEVONPORT add 17 m. PORTSMOUTH add 4 m.

DECEMBER, 1864.

MONTH DAY.	DOVER.								SHEERNESS.								LONDON.								C's AGE AT NOON.		
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.						
	Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.				D.	
1	—	—			0 14	18	5		1 33	15	11		1 53	15	11		3 4	18	11		3 23	19	0		2.2		
2	0 36	18	5		1 0	18	5		2 12	15	11		2 31	15	10		3 43	19	0		4 3	19	0		3.2		
3	1 23	18	4		1 46	18	2		2 52	15	9		3 12	15	8		4 24	18	11		4 44	18	10		4.2		
4	2 11	17	11		2 36	17	7		3 35	15	6		4 0	15	3		5 7	18	8		5 30	18	5		5.2		
5	3 1	17	3		3 26	16	11		4 25	15	0		4 50	14	9		5 56	18	3		6 21	17	11		6.2		
6	3 53	16	6		4 21	16	2		5 19	14	6		5 49	14	3		6 49	17	7		7 17	17	4		7.2		
7	4 49	15	10		5 18	15	8		6 22	14	0		6 56	13	11		7 48	17	2		8 24	17	0		8.2		
8	5 48	15	7		6 21	15	9		7 34	13	11		8 10	14	0		9 1	16	11		9 36	16	9		9.2		
9	6 57	16	1		7 34	16	5		8 46	14	2		9 21	14	5		10 14	16	11		10 48	17	0		10.2		
0	8 6	16	9		8 35	17	2		9 55	14	8		10 25	14	11		11 24	17	2		11 53	17	5		11.2		
1	9 3	17	6		9 31	17	9		10 53	15	2		11 19	15	5		—	—			0 23	17	9		12.2		
2	9 59	18	0		10 24	18	3		11 44	15	7		—	—			0 48	18	0		1 16	18	3		13.2		
3	10 48	18	4		11 13	18	5		0 9	15	9		0 33	15	11		1 40	18	6		2 4	18	8		14.2		
4	11 37	18	5		12 0	18	4		0 56	16	0		1 18	16	0		2 26	18	10		2 47	18	11		15.2		
5	—	—			0 21	18	3		1 40	16	0		2 0	15	11		3 9	19	0		3 29	19	0		16.2		
6	0 42	18	2		1 3	17	11		2 19	15	9		2 38	15	8		3 48	18	11		4 9	18	9		17.2		
7	1 23	17	9		1 44	17	6		2 55	15	6		3 13	15	3		4 26	18	7		4 44	18	5		18.2		
8	2 3	17	3		2 23	16	11		3 33	15	1		3 52	14	10		5 3	18	2		5 22	17	11		19.2		
9	2 43	16	7		3 2	16	3		4 11	14	6		4 31	14	3		5 43	17	8		6 2	17	5		20.2		
0	3 22	15	11		3 41	15	6		4 51	13	11		5 13	13	9		6 22	17	2		6 42	16	10		21.2		
1	4 1	15	2		4 21	14	9		5 35	13	6		5 58	13	4		7 4	16	7		7 25	16	4		22.2		
2	4 46	14	5		5 15	14	3		6 24	13	1		6 55	12	11		7 53	16	1		8 23	15	11		23.2		
3	5 44	14	2		6 13	14	2		7 29	12	11		8 4	12	11		8 58	15	10		9 31	15	9		24.2		
4	6 47	14	4		7 21	14	9		8 38	13	0		9 12	13	3		10 4	15	8		10 36	15	10		25.2		
5	7 53	15	1		8 22	15	6		9 45	13	6		10 15	13	9		11 10	16	0		11 41	16	2		26.2		
6	8 48	16	0		9 13	16	6		10 42	14	1		11 7	14	5		—	—			0 12	16	6		27.2		
7	9 38	16	11		10 2	17	4		11 30	14	8		11 53	15	0		0 36	16	10		0 58	17	3		28.2		
8	10 26	17	9		10 49	18	2		—	—			0 14	15	4		1 21	17	7		1 44	17	11		29.2		
9	11 13	18	6		11 37	18	9		0 36	15	7		0 58	15	10		2 6	18	4		2 28	18	8		30.2		
0	—	—			0 1	18	11		1 19	16	1		1 40	16	2		2 49	18	11		3 10	19	2		31.2		
1	0 25	19	1		0 49	19	2		2 1	16	3		2 22	16	4		3 32	19	5		3 52	19	6		32.2		
If Mean Spring } Range.				9ft. 4in.				8ft. 0in.				9ft. 7in.															

Equation of Time at Noon.

M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Sub.
10	35		9	7	13		17	3	25		25	0	35		25	0	35	
10	11		10	6	45		18	2	55		26	1	4		26	1	4	
9	47		11	6	18		19	2	25		27	1	34		27	1	34	
9	23		12	5	50		20	1	55		28	2	4		28	2	4	
8	58		13	5	21		21	1	26		29	2	33		29	2	33	
8	32		14	4	52		22	0	55		30	3	2		30	3	2	
8	6		15	4	23		23	0	25		31	3	31		31	3	31	
7	40		16	3	54		24	0	5	Sub.								

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

DECEMBER, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.
Th.	1	12 51	0 46	11 5	1 7	11 5	7 26	20 7	7 46	20 7	4 17	14 3	4 36	
F.	2	2 47	1 27	11 4	1 46	11 4	8 6	20 7	8 27	20 6	4 54	14 1	5 16	
S.	3	3 41	2 8	11 3	2 30	11 2	8 48	20 3	9 11	19 11	5 39	13 9	6 2	
Th.	4	4 34	2 53	11 0	3 17	10 11	9 35	19 7	10 0	19 3	6 28	13 4	6 55	
M.	5	5 26	3 41	10 9	4 6	10 7	10 26	18 11	10 57	18 6	7 22	12 10	7 51	
Tu.	6	6 17	4 32	10 6	5 1	10 5	11 33	18 2	—	—	8 21	12 4	8 54	
W.	7	7 8	5 32	10 3	6 3	10 3	0 7	17 10	0 41	17 8	9 27	12 0	10 3	
Th.	8	8 0	6 41	10 3	7 18	10 4	1 14	17 7	1 46	17 8	10 37	11 11	11 11	
F.	9	8 53	7 54	10 5	8 28	10 7	2 18	17 11	2 51	18 4	11 43	12 4	—	
S.	10	9 48	9 2	10 9	9 33	10 11	3 24	18 9	3 54	19 2	0 14	12 7	0 44	
Th.	11	10 43	10 2	11 1	10 30	11 3	4 22	19 7	4 48	19 11	1 13	13 2	1 41	
M.	12	11 39	10 57	11 5	11 23	11 6	5 13	20 2	5 39	20 4	2 8	13 8	2 34	
Tu.	13	morn.	11 46	11 7	—	—	6 3	20 6	6 26	20 7	2 58	13 11	3 19	
W.	14	0 33	0 8	11 7	0 30	11 7	6 49	20 8	7 11	20 7	3 41	14 2	4 3	
Th.	15	1 26	0 52	11 6	1 14	11 5	7 33	20 6	7 52	20 5	4 23	14 2	4 42	
F.	16	2 16	1 34	11 3	1 53	11 2	8 11	20 3	8 30	20 0	5 1	13 11	5 20	
S.	17	3 3	2 12	11 0	2 31	10 11	8 48	19 8	9 8	19 4	5 38	13 5	5 59	
Th.	18	3 48	2 51	10 9	3 9	10 7	9 28	18 11	9 47	18 6	6 19	12 10	6 40	
M.	19	4 31	3 28	10 5	3 47	10 4	10 6	18 2	10 26	17 9	7 2	12 4	7 23	
Tu.	20	5 13	4 6	10 2	4 27	10 0	10 50	17 5	11 15	17 1	7 45	11 9	8 7	
W.	21	5 55	4 48	9 11	5 9	9 9	11 41	16 9	—	—	8 30	11 3	8 55	
Th.	22	6 37	5 33	9 8	6 1	9 7	0 9	16 5	0 39	16 2	9 26	10 11	10 0	
F.	23	7 21	6 36	9 7	7 12	9 7	1 11	16 0	1 41	16 1	10 32	10 10	11 4	
S.	24	8 7	7 46	9 8	8 20	9 10	2 11	16 2	2 42	16 5	11 36	11 0	—	
Th.	25	8 56	8 52	9 11	9 22	10 1	3 13	16 11	3 43	17 4	0 6	11 3	0 34	
M.	26	9 48	9 49	10 4	10 16	10 7	4 11	17 10	4 36	18 4	1 1	11 11	1 26	
Tu.	27	10 43	10 40	10 9	11 4	11 0	4 59	18 10	5 21	19 3	1 51	12 8	2 15	
W.	28	11 39	11 26	11 2	11 48	11 4	5 42	19 8	6 4	20 0	2 38	13 4	3 0	
Th.	29	0 36	—	—	0 10	11 6	6 27	20 4	6 50	20 8	3 20	13 11	3 42	
F.	30	1 33	0 32	11 7	0 53	11 8	7 12	20 11	7 34	21 2	4 3	14 5	4 24	
S.	31	2 28	1 15	11 8	1 37	11 8	7 56	21 3	8 18	21 4	4 45	14 9	5 7	

Half Mean Spring }
Range.

5ft. 9in.

10ft. 5in.

7ft. 2in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.		M.D.	°	'		M.D.	°	'		M.D.	°	'		M.D.	°	'
First Quarter -	6	7	34	Morning.	1	18	8.52		9	12	N. 4		17	11	N. 23		25	1	
Full - - - -	13	7	12	Morning.	2	16	58		10	15	28		18	7	49		26	18	
Last Quarter -	21	5	3	Morning.	3	14	3		11	17	57		19	3	59		27	16	
New - - - -	28	9	21	Afternoon.	4	10	19		12	19	22		20	0	2		28	16	
					5	5	59		13	19	39		21	3	S. 55		29	1	
In Perigee - -	6	10	0	Afternoon.	6	1	20		14	18	51		22	7	45		30	1	
In Apogee - -	20	9	0	Morning.	7	3	N. 25		15	17	5		23	11	20		31	1	
					8	7	58		16	14	32		24	14	30				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 3

DECEMBER, 1864.

NORTH SHIELDS.					LEITH.					THURSO.					C's AGE at Noon.
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			
Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	Time. H. M. F. L.	Height. H. M. F. L.	D.	
4 17 13	0	4 37 12	11	3 13 16	0	3 32 15	11	9 22 12	11	9 42 12	10	2.2			
4 58 12	10	5 20 12	8	3 52 15	10	4 15 15	9	10 5 12	9	10 28 12	6	3.2			
5 43 12	7	6 6 12	5	4 36 15	7	5 0 15	5	10 51 12	3	11 18 12	0	4.2			
6 31 12	3	6 57 12	0	5 26 15	2	5 53 14	11	11 45 11	9	—	—	5.2			
7 24 11	9	7 55 11	5	6 21 14	7	6 50 14	8	0 12 11	5	0 42 11	2	6.2			
8 27 11	1	9 3 10	11	7 22 14	0	7 57 13	9	1 13 10	11	1 48 10	8	7			
9 39 10	10	10 15 10	10	8 32 13	8	9 10 13	7	2 23 10	7	3 3 10	6	8.2			
10 49 10	11	11 23 11	1	9 44 13	8	10 17 13	9	3 41 10	5	4 17 10	6	9.2			
11 57 11	4	—	—	10 50 14	0	11 21 14	3	4 51 10	8	5 23 10	11	10.2			
0 28 11	6	0 56 11	9	11 50 14	6	—	—	5 52 11	2	6 17 11	7	11.2			
1 22 12	0	1 47 12	11	0 16 14	10	0 41 15	2	6 40 12	0	7 3 12	4	12.2			
2 12 12	6	2 36 12	8	1 7 15	6	1 33 15	9	7 25 12	11	7 45 12	11	13.2			
2 57 12	10	3 19 13	0	1 56 15	11	2 18 16	1	8 6 13	1	8 27 13	2	14			
3 41 13	1	4 3 13	1	2 39 16	2	3 0 16	1	8 48 13	1	9 8 13	0	15.2			
4 24 13	0	4 44 12	10	3 20 16	0	3 39 15	10	9 28 12	10	9 48 12	7	16.2			
5 4 12	7	5 23 12	4	3 59 15	7	4 18 15	4	10 8 12	4	10 28 12	1	17.2			
5 43 12	2	6 4 12	0	4 37 15	2	4 57 14	11	10 49 11	9	11 9 11	5	18.2			
6 23 11	9	6 43 11	6	5 17 14	8	5 38 14	4	11 30 11	2	11 52 10	11	19.2			
7 3 11	3	7 24 11	0	6 0 14	1	6 22 13	9	—	—	0 13 10	7	20.2			
7 48 10	8	8 13 10	4	6 44 13	5	7 7 13	1	0 36 10	3	0 59 10	0	21.2			
8 38 10	1	9 6 9	10	7 32 12	10	7 59 12	7	1 22 9	9	1 50 9	7	22			
9 38 9	9	10 12 9	9	8 30 12	5	9 5 12	4	2 22 9	5	2 58 9	3	23.2			
10 44 9	9	11 16 9	11	9 39 12	5	10 11 12	6	3 35 9	3	4 9 9	3	24.2			
11 48 10	1	—	—	10 42 12	7	11 13 12	10	4 43 9	4	5 15 9	6	25.2			
0 20 10	3	0 48 10	6	11 41 13	1	—	—	5 43 9	9	6 9 10	1	26.2			
1 13 10	9	1 36 11	1	0 7 13	5	0 30 13	10	6 31 10	7	6 51 11	1	27.2			
1 58 11	5	2 20 11	9	0 52 14	3	1 15 14	9	7 11 11	7	7 29 12	1	28.2			
2 41 12	2	3 1 12	6	1 37 15	2	1 58 15	7	7 48 12	7	8 8 12	11	29			
3 21 12	10	3 42 13	1	2 20 15	11	2 41 16	3	8 29 13	2	8 49 13	4	30.6			
4 3 13	3	4 25 13	5	3 1 16	5	3 21 16	6	9 10 13	6	9 32 13	6	31.6			
4 47 13	5	5 10 13	4	3 43 16	6	4 5 16	6	9 55 13	6	10 18 13	4	32.6			
Mean Spring } 6ft. 8in. Range.				8ft. 2in.				6ft. 7in.							

Equation of Time at Noon.

M. S.		M.D.	M. S.		M.D.	M. S.		M.D.	M. S.	
10 35	Add.	9	7 13	Add.	17	3 25	Add.	25	0 35	Sub.
10 11		10	6 45		18	2 55		26	1 4	
9 47		11	6 18		19	2 25		27	1 34	
9 23		12	5 50		20	1 55		28	2 4	
8 58		13	5 21		21	1 26		29	2 33	
8 32		14	4 52		22	0 55		30	3 2	
8 6		15	4 23		23	0 25		31	3 31	
7 40		16	3 54		24	0 5	Sub.			

Time of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

DECEMBER, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRAMBIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
Th.	1	18 51	0 46	9 7	1 7	9 8	—	—	0 17	25 8	7 8	20 8	7 27	30 7	
F.	2	2 47	1 27	9 8	1 48	9 8	0 37	25 7	0 58	25 6	7 48	20 6	8 10	30 4	
S.	3	3 41	2 9	9 8	2 31	9 7	1 19	25 2	1 41	24 10	8 33	20 1	8 57	19 9	
S.	4	4 34	2 54	9 6	3 18	9 5	2 5	24 5	2 29	24 0	9 20	19 4	9 43	18 11	
M.	5	5 26	3 43	9 3	4 9	9 2	2 54	23 6	3 20	23 0	10 7	18 6	10 32	18 1	
Tu.	6	6 17	4 37	9 1	5 7	8 11	3 49	22 6	4 22	22 11	10 58	17 7	11 24	17 1	
W.	7	7 8	5 37	8 10	6 10	8 9	4 55	21 9	5 34	21 9	11 54	17 0	—	—	
Th.	8	8 0	6 44	8 11	7 20	8 8	6 12	21 10	6 50	22 1	0 26	17 0	1 5	17 2	
F.	9	8 53	7 56	8 9	8 31	8 11	7 25	22 6	7 59	22 11	1 45	17 5	2 23	17 10	
S.	10	9 48	9 3	9 1	9 32	9 2	8 28	23 5	8 55	24 0	2 57	18 3	3 29	18 15	
S.	11	10 43	10 0	9 3	10 28	9 4	9 21	24 5	9 46	24 10	4 0	19 3	4 30	19 2	
M.	12	11 39	10 56	9 5	11 21	9 6	10 11	25 1	10 35	25 4	4 59	20 1	5 25	20 4	
Tu.	13	morn.	11 45	9 6	—	—	10 58	25 6	11 21	25 8	5 49	20 6	6 12	20 8	
W.	14	0 33	0 9	9 7	0 31	9 7	11 43	25 8	—	—	6 34	20 8	6 55	20 8	
Th.	15	1 26	0 53	9 7	1 13	9 7	0 42	25 7	0 24	25 5	7 15	20 6	7 34	20 8	
F.	16	2 16	1 33	9 6	1 51	9 6	0 44	25 2	1 24	24 10	7 52	20 0	8 10	19 1	
S.	17	3 3	2 9	9 5	2 29	9 4	1 20	24 6	1 39	24 0	8 30	19 4	8 49	18 11	
S.	18	3 48	2 47	9 3	3 6	9 1	1 58	23 6	2 17	23 0	9 8	18 6	9 26	18 1	
M.	19	4 31	3 24	9 0	3 43	8 11	2 35	22 7	2 54	22 1	9 44	17 8	10 3	17 3	
Tu.	20	5 13	4 4	8 9	4 24	8 8	3 15	21 7	3 35	21 11	10 21	16 10	10 39	16 4	
W.	21	5 55	4 44	8 7	5 8	8 5	3 58	20 8	4 23	20 2	10 58	15 10	11 23	15 6	
Th.	22	6 37	5 35	8 3	6 7	8 2	4 54	19 10	5 29	19 9	11 51	15 3	—	—	
F.	23	7 21	6 39	8 1	7 12	8 1	6 5	19 9	6 41	19 11	0 21	15 3	0 54	15 3	
S.	24	8 7	7 46	8 2	8 20	8 3	7 16	20 3	7 48	20 8	1 32	15 5	2 9	15 5	
S.	25	8 56	8 50	8 5	9 19	8 7	8 19	21 1	8 45	21 8	2 43	16 2	3 14	16 5	
M.	26	9 48	9 46	8 9	10 11	8 11	9 9	22 4	9 32	23 0	3 42	17 5	4 10	18 1	
Tu.	27	10 43	10 35	9 0	10 59	9 2	9 55	23 7	10 16	24 2	4 37	18 7	5 2	19 3	
W.	28	11 39	11 23	9 4	11 46	9 5	10 37	24 9	10 59	25 2	5 27	19 9	5 51	20 3	
Th.	29	0 36	—	—	0 10	9 7	11 21	25 8	11 43	26 1	6 14	20 8	6 35	21 1	
F.	30	1 33	0 32	9 9	0 54	9 10	—	—	0 6	26 4	6 57	21 4	7 18	21 6	
S.	31	2 28	1 17	9 11	1 40	9 11	0 28	26 7	0 50	26 7	7 40	21 6	8 2	21 5	
Half Mean Spring Range.			4 ft. 10 in.				13 ft. 0 in.				10 ft. 6 in.				
Phases of the Moon.							Moon's Declination at Noon.								
			D. H. M.				M.D.	°	'	M.D.	°	'	M.D.	°	'
First Quarter-			6	7	34	Morning.	1	18	53	9	12	N. 4	17	11	N. 23
Full - - - -			13	7	12	Morning.	2	16	58	10	15	28	18	7	49
Last Quarter -			21	5	3	Morning.	3	14	3	11	17	57	19	3	59
New - - - -			28	9	21	Afternoon.	4	10	19	12	19	22	20	0	2
							5	5	59	13	19	39	21	3	B. 55
In Perigee - -			6	10	0	Afternoon.	6	1	20	14	18	51	22	7	45
In Apogee - -			20	9	0	Morning.	7	3	N. 25	15	17	5	23	11	20
							8	7	58	16	14	32	24	14	30

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 GREENOCK add 19 m. LIVERPOOL add 18 m. PEMBROKE add 30 m.

DECEMBER, 1864.

WESTON-SUPER-MARE.										HOLYHEAD.										KINGSTOWN.										C's AGE AT NOON.
MORNING.					AFTERNOON.					MORNING.					AFTERNOON.					MORNING.					AFTERNOON.					
Time.	Height.				Time.	Height.				Time.	Height.				Time.	Height.				Time.	Height.				Time.	Height.				
H.	M.	F.	L.		H.	M.	F.	L.		H.	M.	F.	L.		H.	M.	F.	L.		H.	M.	F.	L.		H.	M.	F.	L.		D.
7	51	36	9		8	10	36	9		11	3	15	9		11	23	15	8		—	—	—	—	—	—	—	—	—	—	2'2
8	30	36	9		8	50	36	6		11	46	15	7		—	—	—	—		0	27	10	9		0	49	10	8		3'2
9	11	36	2		9	33	35	7		0	9	15	6		0	34	15	3		1	12	10	6		1	35	10	5		4'2
9	54	34	11		10	14	34	3		1	0	15	0		1	27	14	9		2	0	10	3		2	26	10	1		5'2
10	35	33	5		11	0	32	9		1	54	14	6		2	23	14	3		2	53	9	11		3	22	9	10		6'2
11	27	32	0		11	57	31	5		2	54	14	0		3	29	13	9		3	52	9	8		4	27	9	6		7
—	—	—	—		0	30	31	1		4	4	13	7		4	42	13	7		5	1	9	5		5	34	9	4		8'2
1	4	31	1		1	41	31	3		5	17	13	8		5	51	13	10		6	6	9	5		6	38	9	7		9'2
2	18	31	8		2	56	32	3		6	24	14	1		6	55	14	3		7	11	9	9		7	44	9	11		10'2
3	32	32	10		4	7	33	8		7	24	14	6		7	51	14	10		8	15	10	0		8	45	10	2		11'2
4	40	34	5		5	11	35	2		8	17	15	1		8	42	15	4		9	14	10	4		9	41	10	6		12'2
5	40	35	9		6	6	36	1		9	6	15	6		9	29	15	8		10	6	10	7		10	26	10	9		13'2
6	31	36	4		6	55	36	7		9	51	15	9		10	12	15	10		10	47	10	10		11	9	10	11		14
7	18	36	9		7	39	36	8		10	32	15	10		10	51	15	9		11	31	10	10		11	52	10	9		15'2
7	58	36	6		8	17	36	2		11	9	15	7		11	29	15	5		—	—	—	—		0	12	10	8		16'2
8	34	35	10		8	51	35	5		11	49	15	3		—	—	—	—		0	33	10	7		0	52	10	5		17'2
9	9	34	11		9	26	34	3		0	9	15	0		0	30	14	9		1	11	10	3		1	32	10	1		18'2
9	43	33	7		9	59	32	11		0	51	14	5		1	12	14	2		1	51	9	11		2	12	9	9		19'2
10	15	32	2		10	31	31	5		1	33	13	11		1	54	13	8		2	33	9	8		2	53	9	6		20'2
10	48	30	8		11	6	29	11		2	17	13	4		2	40	13	1		3	15	9	4		3	38	9	2		21'2
11	28	29	3		11	55	28	8		3	3	12	10		3	31	12	7		4	2	9	0		4	29	8	11		22
—	—	—	—		0	26	28	3		4	3	12	6		4	38	12	5		4	59	8	9		5	31	8	8		23'2
0	58	28	2		1	32	28	3		5	12	12	5		5	44	12	6		6	2	8	9		6	32	8	10		24'2
2	7	28	6		2	42	28	11		6	16	12	9		6	47	12	11		7	3	9	0		7	34	9	1		25'2
3	16	29	7		3	49	30	4		7	15	13	2		7	41	13	5		8	3	9	3		8	31	9	5		26'2
4	20	31	4		4	49	32	4		8	5	13	10		8	28	14	3		8	58	9	8		9	24	9	11		27'2
5	18	33	4		5	43	34	4		8	50	14	7		9	10	14	11		9	49	10	1		10	10	10	3		28'2
6	8	35	3		6	33	36	0		9	31	15	3		9	53	15	7		10	29	10	6		10	49	10	9		29
6	56	36	7		7	18	37	3		10	14	15	10		10	34	16	1		11	11	10	11		11	31	11	0		30'6
7	40	37	9		8	1	38	1		10	53	16	2		11	13	16	3		11	53	11	1		—	—	—	—		31'6
8	23	38	3		8	44	38	3		11	36	16	4		11	59	16	3		0	16	11	1		0	39	11	1		32'6
Mean Spring Tide. } 18ft. 7in.										8ft. 0in.										5ft. 6in.										

Equation of Time at Noon.

M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Sub.
10 35		9	7 13		17	3 25		25	0 35	
10 11		10	6 45		18	2 55		26	1 4	
9 47		11	6 18		19	2 25		27	1 34	
9 23		12	5 50		20	1 55		28	2 4	
8 58		13	5 21		21	1 26		29	2 33	
8 32		14	4 52		22	0 55		30	3 2	
8 6		15	4 23		23	0 25		31	3 31	
7 40		16	3 54		24	0 5	Sub.			

es of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 ON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

DECEMBER, 1864.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
			H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
Th.	1	12 51	11 41	9 4	—	—	8 53	7 6	9 11	7 5	6 11	11 0	6 31	—	
F.	2	2 47	0 2	9 4	0 25	9 4	9 31	7 4	9 51	7 3	6 53	10 9	7 15	—	
S.	3	3 41	0 48	9 3	1 12	9 2	10 14	7 1	10 39	6 11	7 38	10 4	8 2	—	
S.	4	4 34	1 39	9 1	2 7	9 0	11 6	6 9	11 39	6 6	8 28	9 10	8 55	—	
M.	5	5 26	2 36	8 11	3 5	8 9	—	—	0 15	6 4	9 28	9 5	10 1	—	
Tu.	6	6 17	3 36	8 8	4 9	8 7	0 53	6 2	1 34	6 1	10 38	9 2	11 14	—	
W.	7	7 8	4 42	8 6	5 16	8 5	2 16	6 1	2 53	6 3	11 49	9 1	—	—	
Th.	8	8 0	5 48	8 5	6 22	8 5	3 24	6 5	3 55	6 7	0 22	9 1	0 56	—	
F.	9	8 53	6 56	8 6	7 29	8 7	4 23	6 9	4 49	6 11	1 29	9 4	2 2	—	
S.	10	9 48	7 58	8 8	8 25	8 10	5 13	7 0	5 36	7 2	2 30	9 9	2 56	—	
S.	11	10 43	8 51	9 1	9 17	9 2	6 1	7 3	6 27	7 4	3 20	10 3	3 44	—	
M.	12	11 39	9 42	9 3	10 5	9 4	6 53	7 5	7 18	7 6	4 8	10 9	4 31	—	
Tu.	13	morn.	10 26	9 5	10 48	9 5	7 41	7 7	8 2	7 8	4 54	11 0	5 18	—	
W.	14	0 33	10 10	9 5	11 29	9 4	8 23	7 8	8 41	7 7	5 40	11 1	5 59	—	
Th.	15	1 26	11 48	9 3	—	—	8 59	7 5	9 17	7 3	6 18	10 11	6 38	—	
F.	16	2 16	0 8	9 3	0 28	9 2	9 35	7 1	9 52	7 0	6 57	10 6	7 15	—	
S.	17	3 3	0 48	9 1	1 9	9 0	10 11	6 10	10 30	6 8	7 35	10 0	7 53	—	
S.	18	3 48	1 30	8 11	1 52	8 10	10 50	6 6	11 14	6 3	8 13	9 5	8 34	—	
M.	19	4 31	2 14	8 8	2 37	8 7	11 39	6 1	—	—	8 56	9 0	9 21	—	
Tu.	20	5 13	3 0	8 5	3 22	8 4	0 8	5 10	0 37	5 8	9 46	8 7	10 12	—	
W.	21	5 55	3 45	8 3	4 10	8 2	1 6	5 7	1 38	5 6	10 40	8 3	11 12	—	
Th.	22	6 37	4 40	8 1	5 12	8 0	2 15	5 6	2 49	5 6	11 44	8 2	—	—	
F.	23	7 21	5 43	8 0	6 15	7 11	3 21	5 8	3 50	5 10	0 16	8 3	0 48	—	
S.	24	8 7	6 48	8 0	7 20	8 0	4 19	6 0	4 44	6 2	1 21	8 4	1 53	—	
S.	25	8 56	7 49	8 2	8 15	8 4	5 7	6 3	5 29	6 5	2 22	8 9	2 47	—	
M.	26	9 48	8 39	8 6	9 2	8 9	5 50	6 7	6 11	6 9	3 10	9 4	3 31	—	
Tu.	27	10 43	9 25	8 11	9 46	9 1	6 34	6 11	6 57	7 2	3 52	10 0	4 12	—	
W.	28	11 39	10 7	9 3	10 28	9 4	7 20	7 4	7 43	7 6	4 33	10 7	4 56	—	
Th.	29	02 36	10 49	9 5	11 10	9 6	8 4	7 8	8 24	7 9	5 18	11 1	5 40	—	
F.	30	1 33	11 31	9 6	11 51	9 6	8 43	7 10	9 3	7 10	6 11	11 5	6 22	—	
S.	31	2 28	—	—	0 14	9 7	9 24	7 9	9 45	7 8	6 45	11 4	7 7	—	
Half Mean Spring Range.			4 ^{ft.} 9 ^{in.}				3 ^{ft.} 10 ^{in.}				5 ^{ft.} 7 ^{in.}				
Phases of the Moon.							Moon's Declination at Noon.								
			D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'
First Quarter	-	6	7	34	Morning.		1	18	52	9	12	N. 4	17	11	N. 23
Full	-	13	7	12	Morning.		2	16	58	10	15	28	18	7	49
Last Quarter	-	21	5	3	Morning.		3	14	3	11	17	57	19	3	59
New	-	28	9	21	Afternoon.		4	10	19	12	19	22	20	0	2
							5	5	59	13	19	39	21	3	8.55
In Perigee	-	6	10	0	Afternoon.		6	1	20	14	18	51	22	7	45
In Apogee	-	20	9	0	Morning.		7	3	N. 25	15	17	5	23	11	20
							8	7	58	16	14	32	24	14	30

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required
 BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

DECEMBER, 1864.

GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
L.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
5	32	14	7	5	53	14	6	5	59	11	7	6	19	11	7	6	20	12	3	6	40	12	4	2.2
6	15	14	5	6	37	14	3	6	41	11	6	7	2	11	5	7	1	12	3	7	22	12	3	3.2
7	0	14	0	7	25	13	9	7	24	11	3	7	48	11	1	7	44	12	2	8	7	12	1	4.2
7	52	13	6	8	19	13	1	8	11	10	11	8	34	10	8	8	29	11	11	8	51	11	8	5.2
8	47	12	8	9	16	12	4	8	59	10	5	9	25	10	3	9	13	11	6	9	39	11	3	6.2
9	48	12	1	10	21	11	11	9	52	10	1	10	21	9	11	10	11	11	0	10	43	10	10	7
0	58	11	11	11	33	12	0	10	56	9	10	11	31	9	10	11	15	10	8	11	46	10	7	8.2
—	—	—	—	0	8	12	2	—	—	—	—	0	6	9	11	—	—	—	—	0	18	10	8	9.2
0	41	12	5	1	13	12	8	0	42	10	1	1	20	10	3	0	52	10	10	1	28	11	0	10.2
1	41	12	11	2	8	13	3	1	53	10	5	2	24	10	8	2	3	11	2	2	37	11	5	11.2
2	36	13	6	3	3	13	10	2	54	10	10	3	22	11	1	3	9	11	8	3	40	11	10	12.2
3	28	14	1	3	51	14	3	3	50	11	3	4	14	11	5	4	9	12	0	4	36	12	1	13.2
4	13	14	5	4	35	14	7	4	37	11	6	5	1	11	7	5	0	12	2	5	23	12	2	14.2
4	57	14	7	5	19	14	6	5	24	11	7	5	46	11	7	5	45	12	3	6	6	12	3	15.2
5	39	14	5	5	59	14	3	6	5	11	6	6	25	11	5	6	26	12	2	6	46	12	1	16.2
6	18	14	0	6	37	13	9	6	44	11	3	7	2	11	1	7	5	12	0	7	24	11	11	17.2
6	58	13	6	7	17	13	2	7	21	10	11	7	40	10	8	7	43	11	9	8	0	11	7	18.2
7	37	12	10	7	58	12	7	7	59	10	6	8	16	10	3	8	17	11	5	8	35	11	3	19.2
8	18	12	2	8	40	11	9	8	33	10	1	8	53	9	10	8	51	11	1	9	9	10	10	20.2
9	2	11	5	9	24	11	1	9	13	9	7	9	31	9	5	9	27	10	8	9	47	10	5	21.2
9	49	10	10	10	20	10	8	9	52	9	3	10	19	9	1	10	12	10	2	10	42	9	11	22.2
0	53	10	7	11	27	10	8	10	52	9	0	11	25	8	11	11	13	9	10	11	43	9	9	23.2
2	0	10	9	—	—	—	—	11	58	9	0	—	—	—	—	—	—	—	—	0	13	9	8	24.2
0	33	10	11	1	5	11	2	0	32	9	1	1	6	9	3	0	44	9	10	1	16	9	11	25.2
1	33	11	5	1	58	11	9	1	40	9	5	2	10	9	8	1	48	10	2	2	20	10	5	26.2
2	22	12	3	2	46	12	8	2	38	9	11	3	4	10	3	2	50	10	9	3	19	11	0	27.2
3	10	13	0	3	32	13	5	3	29	10	6	3	53	10	10	3	47	11	3	4	12	11	7	28.2
3	53	13	10	4	15	14	2	4	16	11	2	4	39	11	5	4	38	11	10	5	2	12	1	29.2
4	37	14	7	4	58	14	10	5	2	11	7	5	24	11	9	5	25	12	3	5	45	12	5	30.2
5	20	15	1	5	42	15	2	5	47	11	11	6	9	12	0	6	7	12	7	6	29	12	8	31.2
6	5	15	2	6	28	15	1	6	32	12	0	6	54	12	0	6	52	12	9	7	15	12	9	32.2
Mean Spring } 7ft. 5in. Tide. nge.								5ft. 10in.								6ft. 2in.								

Equation of Time at Noon.

M. S.		M.D.	M. S.		M.D.	M. S.		M.D.	M. S.	
10 35	Add.	9	7 13	Add.	17	3 25	Add.	25	0 35	Sub.
10 11		10	6 45		18	2 55		26	1 4	
9 47		11	6 18		19	2 25		27	1 34	
9 23		12	5 50		20	1 55		28	2 4	
8 58		13	5 21		21	1 26		29	2 33	
8 32		14	4 52		22	0 55		30	3 2	
8 6		15	4 23		23	0 25		31	3 31	
7 40		16	3 54		24	0 5	Sub.			

s of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
ALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.
G

TIDE TABLES FOR THE

TABLE (B.)—For finding the Height of the Tide at any intermediate Hour between High and Low Water.

Height above Half-tide or Mean Level of the Sea.	Time from High Water.													
	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
	0 00	0 30	1 0	1 30	2 0	2 30	3 0	3 30	4 0	4 30	5 0	5 30	6	
Feet.	Add							Subtract						
	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.
3	3	0	2	11	2	7	2	1	1	6	0	9	0	0
4	4	0	3	10	3	6	2	10	2	0	1	0	0	0
5	5	0	4	10	4	4	3	6	2	6	1	3	0	0
6	6	0	5	10	5	2	4	3	3	0	1	7	0	0
7	7	0	6	9	6	1	4	11	3	6	1	10	0	0
8	8	0	7	9	6	11	5	8	4	0	2	1	0	0
9	9	0	8	8	7	9	6	4	4	6	2	4	0	0
10	10	0	9	8	8	7	1	5	0	2	7	0	0	0
11	11	0	10	8	9	6	7	9	5	6	2	10	0	0
12	12	0	11	7	10	5	8	6	6	0	3	1	0	0
13	13	0	12	7	11	3	9	2	6	6	3	4	0	0
14	14	0	13	6	12	1	9	11	7	0	3	7	0	0
15	15	0	14	6	13	0	10	7	7	6	3	11	0	0
16	16	0	15	5	13	10	11	4	0	4	2	0	0	0
17	17	0	16	5	14	9	12	0	8	6	4	5	0	0
18	18	0	17	5	15	7	12	9	9	0	4	8	0	0
19	19	0	18	4	16	5	13	5	9	6	4	11	0	0
20	20	0	19	4	17	4	14	2	10	0	5	2	0	0
21	21	0	20	3	18	2	14	10	10	6	5	5	0	0
22	22	0	21	3	19	1	15	7	11	0	5	8	0	0
23	23	0	22	3	19	11	16	3	11	6	5	11	0	0
24	24	0	23	2	20	9	17	0	12	0	6	2	0	0

RULE.—To find the Height of the Tide above the zero of the tables at any intermediate Hour between *High and Low Water*.*

The zero of the tables is the mean height of the low water of ordinary spring tides.

From the height in the tables, subtract the half mean spring range, the remainder will be the height above the half-tide or mean level of the sea, with which enter Table (B.), and, under the time from high water, take out the corresponding correction, and, as directed, add it to,

* The mean interval of time between two consecutive high waters is about 12h. 25m., but for the mariner's purpose the duration of flood or ebb may be considered as 6 hours. There are occasional exceptions; at Portsmouth, for example, the flood runs 7 hours and the ebb 5 hours.

or subtract it from, the half mean spring range; the result will be the height of the tide at that time above zero or the low-water standard of the tables.

EXAMPLE I.

Required the height of the tide above zero at Liverpool on March 2nd, P.M., at 2 h. after high water.

	Ft.	in.
Height of high water (by the tables) - - -	20	0
Half mean spring range - - -	13	0
<hr/>		
Height above the half-tide or mean level of the sea - =	7	0
Half mean spring range - - -	13	0
By table (B) 7 ft. 0 in. gives - - - +	3	6
<hr/>		
Height of the tide above zero at 2 h. after high water =	16	6

EXAMPLE II.

Required the height of the tide above zero, at Liverpool on March 9th, A.M., at 4 h. after high water.

	Ft.	in.
Height of high water (by the tables) - - -	28	6
Half mean spring range - - -	13	0
<hr/>		
Height above the half-tide or mean level of the sea -	15	6
Half mean spring range - - -	13	0
By table (B) 15 ft. 6 in. gives - - - —	7	9
<hr/>		
Height of the tide above zero at 4 h. after high water =	5	3

In some cases, however, between 5 and 6 h. from high water, the correction from table (B) will be greater than the half mean spring range; when such is the case, the tide at that time will have fallen *below* the zero of the tables by a quantity equal to the difference between the correction from table (B) and the half mean spring range.

EXAMPLE III.

Required the level of the tide at Liverpool on March 9th, A.M. at 5½ h. after high water.

	Ft.	in.
Height of high water (by the tables) - - -	28	6
Half mean spring range - - -	13	0
<hr/>		
Height above the half tide or mean level of the sea -	15	6
Half mean spring range - - -	13	0
By table (B) 15 ft. 6 in. at 5½ h. from high water -	15	0
<hr/>		
Level of the tide <i>below</i> zero - - -	2	0

As stated in the advertisement, the soundings in most charts are reduced to the same zero as these tables,—viz., the mean level of the low water of ordinary spring tides,—but should the soundings on any particular chart be reduced to a standard below that zero, there will, in that case, be a greater depth of water in the channel than is given in the tables, by a quantity equal to the difference between the half mean spring range and the half spring range of the chart, or in other words, the difference between the mean level of the low water of spring tides, and the low-water standard to which the soundings on the chart are reduced: for example—The soundings on the chart of Liverpool are reduced to

ISLANDS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Weston-super-mare.	— 2 10	..	Weston-super-mare.
Island	— 1 41	..	"
Island	— 1 39	..	"
Island	— 1 24	..	"
Island	— 1 12	..	"
Island	— 0 4	..	"
Island	+ 0 22	..	"
Island (King Road)	+ 0 2	..	"
Island	+ 0 5	..	"
Island (Mumbles Lighthouse)	— 0 11	..	Pembroke.
Island	+ 0 4	..	"
Island	— 0 12	..	"
Island Haven (entrance)	— 0 20	..	"
Island, Goodie Pier	— 3 15	— 4 5	Holyhead.
Island	— 3 10	..	"
Island	— 2 40	— 3 0	"
Island	— 2 11	..	"
Island	— 2 31	..	"
Island	— 2 25	..	"
Island	— 2 31	..	"
Island	— 1 41	..	"
Island	— 0 38	— 2 3	"
Island	— 0 51	— 4 7	Liverpool.
Island (Wyre Lighthouse)	— 0 12	..	"
Island	+ 0 3	+ 1 3	"
Island	— 0 9	— 2 9	"
Island Head and Port Har-	— 0 18	..	"
Island	— 0 19	..	"
Island	— 0 20	..	"
Island Head	— 0 13	..	"
Island	— 0 3	..	"
Island Foot	+ 0 33	..	"
Island	+ 0 47	..	"
Island, Isle of Man	+ 1 1	..	Holyhead.
Island	+ 1 1	+ 3 3	"
Island	+ 0 57	+ 0 3	"
Island, Solway Firth	— 0 1	— 2 11	Liverpool.
Island	— 0 58	..	Greenock.
Island	— 0 56	..	"
Island	— 0 19	..	"
Island	— 0 23	..	"
Island	— 0 18	— 1 0	"
Island	— 0 23	..	"
Island	— 0 18	..	"
Island	— 0 2	..	"
Island	+ 0 10	..	"
Island	+ 1 17	..	"
Island	+ 4 41	..	"
Island, Isle of Mull	— 2 52	..	Thurso.
Island, Isle of Skye	— 1 56	..	"
Island	— 1 47	..	"
Island	— 2 12	..	"
Island, Summer Isles	— 1 51	..	"
Island, Isle of Lewis	— 1 42	..	"
Island	— 0 58	..	"

Over the Sill of Canada Half-tide Dock, W. Entrance	.
„ Northern West Lock Entrance	- .
„ Southern West Lock Entrance	- .
„ „ North Passage	.
„ „ South Passage	.
„ Canada Dock, South Passages, East	- .
„ „ „ West	-
„ „ Lock	- -
„ Huskisson Dock, East Lock	- -
„ „ „ West „	- -
„ Sandon Dock, West Entrance	- -
„ Wellington Half-tide Dock, East Entrance	
„ „ „ West „	-
„ Wellington Dock, West Passage	- -
„ Bramley-Moore Dock, North Passage	-
„ „ „ South Passage	-
„ Nelson Dock, South Passage	- -
„ Stanley Dock, West Passage	- -
„ Collingwood Dock, West Passage	-
„ Salisbury Dock, West Entrances, North	-
„ „ „ South	-
„ Clarence Graving Dock Basin, N. Passage	
„ „ „ S. Passage	
„ Clarence Half-tide Dock, West Entrance	-
„ „ Dock, West Passage	- -
„ Trafalgar Lock, North and South Passages	
„ „ Dock, South Passage	- -
„ Victoria Dock, South Passage	- -
„ Waterloo Dock and Lock, North Passage	-
„ „ „ South Entrance	
„ Princes Dock and Locks, North Entrance	
„ „ „ South Entrance	
„ Georges Dock and Passage, North Entrance	
„ „ „ South Passage	
„ Manchester Dock, West Entrance	-
„ „ Lock, West Entrance	-
„ Canning Dock, West Passage	- -
„ „ Half-tide Basin, two West En- } trances, each	- -
„ Albert Dock, North Passage	-
„ „ East Passage	- -
„ Salthouse Dock, North Passage	- -
„ Wapping Basin, West Passage	- -
„ „ North and South Passages, } each	- -
„ „ Dock, West Passage	- -
„ „ South Passage	- -
„ Kings Dock, South Passage	- -
„ Queens Dock Basin, West Entrances, North	
„ „ „ South	
„ „ West Passage	- -
„ „ South Passage	- -
„ Coburg Dock, West Entrance	- -
„ Brunswick Dock, North Passage	- -
„ „ Half-tide Dock, East Passage	-
„ „ „ West Entrance	
„ Toxteth Dock, West Entrance	- -
„ Harrington Dock, West Entrance	-
„ Garston Dock	- -

Liverpool—continued :

		Ft.	in.
Over the Sill of River Craft Dock, Lock, and Eagle Basin,		—	8 6
	Outer Gates }		
„	„	—	9 6
„	Duke of Bridgewater's Dock, Outer Gates	—	3 9
„	„	—	8 9
„	„	—	2 3
„	Canada Lock and Graving Dock	—	0 6
„	Huskisson Lock and Graving Dock	—	1 9
„	Sandon Graving Docks, Nos. 1 to 5, East	—	4 9
„	„	—	4 9
„	„	—	10 0
„	„	—	8 3
„	Queens Graving Docks, No. 1	—	6 7
„	„	—	4 9
„	Brunswick Graving Docks, No. 1	—	5 9
„	„	—	5 9

Birkenhead—

Over the Sill of Morpeth Dock from Morpeth Basin	-	-	3	3
„ Sills of Caisson between Egerton and Morpeth	}	-	0	9
Docks				
„ Sill of Reverse Gate	-	-	2	9
„ Sills of Caisson between Egerton Dock and Great	}	-	0	9
Float				
„ „ East and West Floats	-	-	0	9
„ Lock from Low-water Basin into Great Float*				
	Outer Sill	+	3	9
	Inner Sill	+	0	9
„ Graving Dock No. 1.*	-	-	0	9
„ „ 2.*	-	-	0	9
(applied to the heights given for Liverpool.)				

(applied to the heights given for Liverpool.)

Dublin—

Over the Sill of North Wall Graving Dock	—	+ 6 0
„ Old Custom House Dock	—	+ 3 5
„ Georges Dock	—	+ 5 5
„ Camden Lock of Grand Canal Dock	—	+ 7 0

(applied to the heights given for Kingstown.)

Londonderry—

Over the Sill of Graving Dock	—	+ 6 9
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TIDAL CONSTANTS

FOR

VARIOUS BRITISH, IRISH, AND EUROPEAN PORTS.

THE following table contains Tidal Constants for several places on the coasts of the United Kingdom and of Europe, which, being applied according to the sign + or — to the times or heights belonging to the standard port to which each of them is referred, will afford a ready means of determining approximately the height as well as the time of high water at each of those several places.

[NOTE.] In the tables from 1850–1858 the Constants for the height were given for such places only where the curves for the place and the standard port were similar, the Constant being the difference between the whole rise at the two places. But as that arrangement, which at times referred necessarily to a standard port on a distant part of the coast, appears to have confused the mariner, he is now referred to the standard port in the locality of the required place, which although the result deduced thereby may not be strictly accurate, yet it is sufficiently near for practical purposes.

* In course of construction, and nearly completed.

COAST OF IRELAND	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Skull	— 0 59	— 2 1	Queenstown.
Crookhaven	— 0 52	..	"
Dunmanus Harbour	— 1 4	— 2 4	"
Dunbeacon, Dunmanus Bay	— 1 10	— 1 7	"
Black Ball Harbour	— 1 21	— 2 3	"
Castletown, Bearhaven	— 0 47	— 2 0	"
Bantry Harbour	— 1 14	— 1 7	"
West Cove, Kenmare River	— 1 9	— 1 9	"
Valentia Harbour	— 1 19	— 0 8	"
Limerick, R. Shannon	+ 1 45	+ 1 9	Galway.
Mellon	+ 1 26	..	"
Foynes Island	+ 1 0	+ 0 7	"
Tarbert	+ 0 22	— 0 7	"
Kilrush	+ 0 7	..	"
Carrigaholt	+ 0 9	..	"
Kilbaha	— 0 19	— 1 9	"
Roundatone	— 0 50	+ 1 9	Sligo.
Inishbofin	— 0 44	+ 0 4	"
Westport	— 0 21	+ 1 1	"
Achillbeg	— 0 4	— 0 6	"
Blacksod Bay (Quay)	— 0 31	..	"
Broadhaven Harbour	— 0 18	— 0 9	"
Donegal Harbour, (Salthill Quay)	+ 0 5	..	"
Killybegs	+ 0 13	..	"
Lough Rossmore	+ 0 19	..	"
Gweedore Bay (Bunbeg)	+ 0 14	— 0 6	"
Sheephaven	+ 0 7	+ 0 7	"
Rathmullan, Lough Swilly	+ 0 24	..	"
Coleraine	— 1 37	— 1 6	Londonderry.
Port Rush	— 1 53	— 2 6	"
Ballycastle Bay	— 4 18	..	Belfast.
Lough Larne	— 0 13	..	"
Donaghadee	+ 0 3	+ 0 3	Kingstown.
Lough Strangford (Killard Point)	— 0 17	..	"
" Strangford Quay	+ 1 21	..	"
" Carlingford (Bar) or Cranfield Point	— 0 10	..	"
Warrenpoint	0 0	+ 3 1	"
Howth	— 0 1	..	"
Dublin Bar	+ 0 2	..	"
Wicklow	— 0 41	..	"
Arklow	— 2 25	..	"
Wexford	+ 2 1	— 7 4	Waterford.
New Ross	+ 0 44	+ 0 1	"
Waterford Bridge	+ 0 46	+ 1 0	"
Dunmore	+ 0 7	— 0 2	"
Ballinacourty, Dungarvan	— 0 8	0 0	"
Youghal	— 0 6	+ 0 3	"
Ballycotton	— 0 26	— 0 5	"
Kinsale	— 0 18	— 0 4	Queenstown.
Courtmacsherry	— 0 25	— 1 1	"
Castletownsend	— 0 40	— 1 0	"
Baltimore	— 0 38	..	"

From Bolt Tail to Start Point, at 4 miles off shore, the eastern stream sets at 3 hours after high water, and the western stream 3 hours before low water on the shore; the stream sets along the land, and its greatest velocity is $2\frac{3}{4}$ knots. At neaps the turn of the stream is regular, varying from 4 to 7 hours after high and low water on the shore, the average being 5 hours. Its rate at neaps is $1\frac{1}{2}$ knots: off Start $2\frac{1}{2}$ knots.

Off Exmouth Bar, at three quarters of a mile, south of Straight Point, at full and change, the stream turns to the eastward at 3h. 40m. and to the westward at 11h. 0m., running in the latter direction about 4 hours. The direction of the western stream for the first 2 hours is S.W.; for the next 2 hours west, and then turns gradually to the northward. The direction of the eastern stream for the first quarter is E. by N.; at half-tide, E. by N.; and the greatest velocity of both streams is about 1 knot.

Three miles south of Beer Head, the stream turns to the westward at 1h. 30m., and runs in that direction 4 hours, then gradually turns to the northward and runs for 2 hours between W.N.W. and N.E. by N. It may be said to turn to the eastward about 5 o'clock, and for $2\frac{1}{2}$ hours, until half tide, sets from N.E. to E. by N., and for the next 3 hours gradually turns to the southward. The direction of the tide in this position is, therefore, round the compass, with little or no velocity, as even at springs it scarcely runs a knot, and that only for a very short period.

West Bay, at 2 miles N.N.W. of the Bill of Portland, at full and change, the tide begins to turn at 6h. 35m. and sets as follows: 1st hour of the ebb by the shore, at Portland Breakwater, S. $\frac{1}{2}$ E., $1\frac{1}{2}$ knots. 2d hour, S. $\frac{1}{2}$ W., $1\frac{3}{4}$ knots. 3d hour, S. by W. $\frac{1}{2}$ W., $1\frac{1}{2}$ knots. 4th hour, S.W. by S., three quarters of a knot. 5th hour, N.W. $\frac{3}{4}$ N., nil. 6th hour, from N.N.W. to N. $\frac{1}{2}$ W., three quarters of a knot. 7th hour, E. by N., 1 knot. 8th hour, S.E. $\frac{1}{4}$ E., $1\frac{1}{4}$ knots. 1st hour of flood, S.E. by S., $1\frac{1}{2}$ knots. 2d, 3d, 4th, and 5th hours, S.S.E., 2 knots. At $2\frac{1}{4}$ miles S.E. $\frac{1}{2}$ S. of the Bill of Portland, near the west end of the Shambles, the 1st hour of the flood by the shore sets west, at the rate of $1\frac{1}{4}$ to half a knot. 2d hour, E. $\frac{1}{2}$ N., half a knot. 3d hour, E. by N., $2\frac{3}{4}$ knots. 4th hour, E.N.E. $\frac{3}{4}$ E., $3\frac{3}{4}$ knots. 5th hour, east, $3\frac{1}{2}$ knots. At the 1st hour of the ebb, E. by S., $3\frac{1}{2}$ knots. 2d hour, E. by S. to S.E. by S., $2\frac{1}{2}$ to $1\frac{1}{2}$ knots. 3d hour, south, 1 knot. 4th hour, S.W. by S., $1\frac{1}{2}$ knots. 5th hour, W.S.W. $\frac{1}{2}$ W., $1\frac{1}{2}$ knots. 6th hour, W. by S., 2 knots. 7th hour, W. by S., $2\frac{1}{4}$ knots. 8th hour, W.S.W. $\frac{3}{4}$ W., $1\frac{3}{4}$ knots. N.B.—About a mile south of the Bill, at half tide, by the shore, the tide sets from S.S.E. to S.E. $\frac{1}{2}$ E., and the opposite stream about W.S.W. $\frac{1}{2}$ W.: the velocity of both streams, at springs, is from 5 to 6 knots; but although the tide runs with such violence near the Race, about a mile S.W. of the Bill the tide was found very weak.

At 5 miles E.S.E. of the Bill of Portland, near the east end of the Shambles, the 1st hour of the flood by the shore sets west, $1\frac{1}{2}$ knots.

2d hour, from West to N. by E., very weak. 3d hour about E.N.E., very weak. 4th hour, E. by N., 2 knots. 5th hour, E. by N., $2\frac{3}{4}$ knots. At the 1st hour of the ebb sets E.N.E., $3\frac{1}{2}$ knots. 2d hour, E.N.E., $3\frac{1}{4}$ knots. 3d hour, east, $2\frac{3}{4}$ knots. 4th hour, east and E. by N., $1\frac{1}{4}$ knots. 5th hour, east, N. by W., and W. by N., very weak. 6th, 7th, and 8th, out west, from $2\frac{3}{4}$ to $2\frac{1}{4}$ knots.

In Portland and Weymouth Roads there is very little tide, so that the stream is scarcely sensible, and continues to be very moderate along the shore from Weymouth to St. Albans Head.

S.S.W. $\frac{1}{2}$ W., $1\frac{1}{4}$ miles from St. Albans Head, the western stream, at full and change, makes at 10h. 45m., and the eastern stream at 11h. 45m.: the flood and ebb are of equal duration, the former setting from E. by N. to E. by S., and the latter from W.N.W. to N.W. by W.; their greatest velocity being at half tide from $4\frac{1}{2}$ to $4\frac{3}{4}$ knots.

At 1 mile S.E. of Durlstone Head, at full and change, the western stream makes at 10h. 25m., and the eastern stream at 4h. 25m., the former setting W.S.W., and the latter E.N.E.; their greatest velocity being about 3 knots: the indraught of the flood stream in thick weather might prove fatal to a ship not on her guard.

At a third of a mile E.S.E. of Peverel Point, at full and change, the western stream makes at 8h. 40m., and the eastern stream at 4h. 0m., the former setting S.W. and the latter N.E.; on the ebb there is a dangerous race over the Ledge, which extends about a mile off the Point. The velocity of the ebb stream is about 3 knots, and that of the flood about $1\frac{1}{2}$ knots. Off Old Harry at three quarters of a mile N.E. by E. of Standfast Point, at full and change, the western stream makes at 9h. 45m., and the flood or eastern stream at 4h. 10m., the flood setting from N.E. by E. to N. by E. at the rate of 1 knot, and the ebb from S. by W. to S.W. 2 knots.

At the Needles, at full and change, the western stream makes at 10h. 0m., and the flood or eastern stream at 3h. 40m., and the velocity of both streams over the Bridge and in the South Channel is from 3 to 4 knots; but between Hurst Point and the Island, $5\frac{1}{2}$ knots, and to the southward of the Bridge about 2 knots. In the Solent, the eastern flood stream makes at 4h., and near the Bramble at 4h. 30m.*

In Freshwater Bay, about 1 mile S.W. of Brook Point, and the same distance off Atherfield Point, at full and change, the western stream makes at 10h. 25m., and runs at the rate of 1 knot, and the flood or eastern stream at 2h. 35m. from 2 to $2\frac{3}{4}$ knots; both streams take the direction of the coast. W. by S. $4\frac{1}{2}$ miles from St. Catherine Point, the western stream makes at 11h., setting N.W. $\frac{3}{4}$ W. and the flood or eastern stream at 5h., in the opposite direction S.E. $\frac{3}{4}$ E., the rate of both being from 2 to 4 knots; but at 1 mile W. by S. from the Point the streams set N.W. by N. and S.E. by S., 3 to 4 knots, and at two thirds of a mile S.S.W. of the Point, W. by N. and E. by S., with the same velocity.

Nearly 5 miles S.S.E. of Dunnose, at full and change, the stream turns at 10h. 40m. and 4h. 30m. and sets E. $\frac{1}{2}$ S. and W. by N.; velocity, from 4 to 5 knots; but S.E., 2 miles from Dunnose, the flood sets E. by N., and turns at the same time as in Portsmouth Harbour, and the ebb W. by S., but one hour earlier than it does in the harbour.

Princessa. At the N.W. buoy, at full and change, the western stream makes at 10 o'clock, and runs 6 hours W.S.W. $\frac{1}{2}$ W. The eastern stream commences at 4 o'clock, and sets very nearly in the opposite direction, E.N.E. At the S.E. buoy the tides are about half an hour later, and set as follows; viz., the western stream, first part, W. $\frac{3}{4}$ S., gradually becomes more southerly, and at the last of the tide runs S.W. by S. The course of the eastern stream is pretty nearly the same throughout the whole of the tide, E. by N.

At the Nab Light Vessel, the tidal stream is nearly rotary, which is probably caused by the Spithead tide meeting the tide round Dunnose

* In the Solent, and as far to the westward as Portland, there are what are termed the *first* and *second* high waters. This double high water is probably caused by the tidal stream at Spithead, for, as long as that stream runs strong to the westward the tide is kept up in Southampton water, and there is no fall of consequence until the stream begins to slack at Spithead, but when the stream makes to the eastward at Spithead the water falls rapidly at Southampton. After low water, the tide rises there pretty steadily for 7 hours, which may be considered as the *first* or proper high water; it then ebbs for an hour about 9 inches, at the end of which time it again commences to rise, and in about $1\frac{1}{4}$ hours reaches its former level, and sometimes higher; this is called the *second* high water. To the mariner, the knowledge that the high water at Southampton remains nearly stationary for rather more than 2 hours may, in some cases, be important. Similar *first* and *second* high waters occur on either shore of the Solent, as shown in the times of high water at full and change, page 149.

At Havre, on the French coast, the high water remains stationary for one hour, with a rise and fall of 3 or 4 inches for another hour, and only rises and falls 13 inches for the space of 3 hours; this long period of nearly slack water is very valuable to the traffic of the port, and allows from 15 to 16 vessels to enter or leave the docks on the same tide.

PORTS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Southampton	— 1 11	..	Portsmouth.
West Cowes	— 0 56	..	"
Hurst Camber	— 1 41	..	"
Needles Point	— 1 55	..	"
Christchurch	— 2 41	..	"
Poole	— 2 31	..	"
Portland Breakwater	— 4 40	— 5 10	"
Lyme Regis	+ 0 38	..	Devonport.
Exmouth	+ 0 38	..	"
Torbay	+ 0 17	..	"
Dartmouth	+ 0 33	..	"
Plymouth Breakwater	— 0 6	..	"
East Looe	— 0 17	..	"
Fowey	— 0 29	..	"
Falmouth	— 0 46	..	"
Penzance	— 1 13	..	"
Scilly Isles (St. Mary)	— 1 16	..	"
WESTERN COAST OF EUROPE.			
Gibraltar	— 1 27	..	Brest.
Cadiz	— 2 2	..	"
Lisbon (Bar)	— 1 17	..	"
Oporto	— 1 17	..	"
Ferrol	— 0 47	..	"
Santander	— 0 17	..	"
Bayonne	— 0 2	..	"
Arcachon	+ 0 50	..	"
Tour de Cordouan	— 0 10	..	"
Bordeaux	+ 3 3	..	"
Ile d'Aix	— 0 27	..	"
Ile d'Yeu	— 0 41	..	"
Ile de Noirmoutier	— 0 45	..	"
Port Navalo	— 0 5	..	"
St. Nazaire	— 0 7	..	"
Belle Ile	— 0 29	..	"
Port Louis	— 0 36	..	"
Port Concarneau	— 0 35	..	"
Ile de Sein	— 0 26	— 1 9	"
Ouessant (Ushant)	— 0 15	— 0 1	"
NORTHERN COAST OF EUROPE.			
Abervrach	+ 0 27	..	Brest.
Morlaix	+ 1 6	..	"
Plougrescan	+ 1 30	..	"
Bréhat	+ 2 4	..	"
St. Malo	+ 2 18	..	"
Granville	+ 2 26	..	"
Ile de Chausey	+ 2 22	..	"
Jersey (St. Helier)	+ 2 38	..	"
Guernsey (St. Peter Port)	+ 2 50	..	"
Ecrehous	+ 2 45	..	"

NORTHERN COAST OF EUROPE.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Alderney	+ 2 59	..	Brest.
Cherbourg	+ 4 2	..	"
Barfleur	+ 5 4	..	"
La Hougue	+ 4 55	..	"
Honfleur	+ 5 42	+ 4 3	"
Quillebœuf	+ 6 19	- 9 7	"
Havre	+ 6 4	..	"
Fécamp	+ 6 57	+ 4 2	"
Dieppe	+ 7 19	..	"
Cayeux	+ 7 18	..	"
Boulogne	+ 0 13	..	Dover.
Cape Grisnez	+ 0 15	+ 2 4	"
Calais	+ 0 37	+ 0 10	"
Dunkerque	+ 0 56	..	"
Nieuport	+ 1 6	..	"
Ostend.	+ 1 13	..	"
Flushing	+ 2 8	..	"
Antwerp	+ 5 13	..	"
Hellevoetsluis	+ 3 18	..	"
Rotterdam	+ 4 33	..	"
Helgoland	- 0 33	- 2 10	Harwich.

SET OF THE TIDES ALONG THE SOUTH COAST OF ENGLAND.

The tides about Plymouth Sound are tolerably regular, both flood and ebb, generally running each way about six hours and ten minutes at a mean. In Hamoaze the flood stream continues to run up, on spring tides, about fifteen minutes after high water at Devonport Dock-Yard.

It is high water in Catwater rather earlier than at the Dock-Yard ; but with strong winds from the southward and westward the tide flows half an hour longer in both harbours.

At the Breakwater in Plymouth Sound it is high water a few minutes earlier than at the Dock-Yard, but the stream drains in for a short time after the water has ceased to rise.

Abreast of Plymouth Sound, about 6 miles from the land, the streams are very irregular and do not turn with the tide farther out in the offing. One hour and three-quarters before high water at the Dock-Yard the stream makes to the eastward and runs about E. by S. for one hour ; during the next hour it is scarcely sensible, after which it turns to the southward, gradually changing to W.S.W. till the last quarter of the ebb on the shore, when it veers from W.S.W. to W.N.W. During the first 3 hours flood on the shore, its direction changes from W.N.W. to N.W., when it begins to slacken, and to set about North, till at the last 4½ hours flood it runs E. by S. as at first.

Four miles south-west of the Eddystone the stream begins to run E. by S. when it is high water at the Dock-Yard, and continues about two hours and three-quarters, when it slacks and shifts to the southward. At 3¼ hours ebb on the shore it sets W.S.W. ; at 4 hours W. by N. ; and then W.N.W. until low water. During the first 2 hours flood on the shore the stream sets N.W. by W., and loses its strength during the third hour, running N.W. and North. During the fourth hour, what little stream there is sets N.N.E. and N.E. ; and then E.N.E and E. by N. till about high water, when its direction is E. by S.

Near the Norfolk and Suffolk coasts the streams of tide run nearly parallel to the shore. Off Wells the flood runs to the eastward till 10 o'clock, or three hours after high water on the shore.

Four miles off Cromer, and the same distance off Hasborough, the flood stream runs along shore to the southward till 10h. 15m., or 1h. 45m. before high water at Harwich, and the ebb in a contrary direction.

At 2½ miles off Lowestoft the flood stream continues to run to the S.W. till 1h. 30m. before high water at Harwich.

At Orfordness the flood stream continues to run till about high water at Harwich Harbour; the flood sets W.S.W., and the ebb E.N.E.

At Margate it is high water about 1h. 40m. by the ground. Near

East buoy of Margate Sand, at the first of the flood, on the shore the stream sets S. by W., veering westward, till about half flood, or 15m., it sets west, and continues veering, till at high water it falls slack at N.N.W. The ebb stream begins at N.E., veering eastward, increasing in strength till about half ebb, or 2h. 45m., when it sets S.E. by E., still veering, and the latter part with diminished velocity, till at low water it falls slack at south.

In the River Medway the flood stream runs up in mid-channel from twenty to twenty-five minutes after high water at Sheerness Dock-Yard; at the Nore Light Vessel, although it is high water by the ground a few minutes earlier than at the Dock-Yard, yet the stream runs up the river for half an hour after high water at the Yard.

It remains to be noticed that the direction of strong winds, as well as the varying pressure of the atmosphere, considerably affect both the times and the heights of high water. Thus in the North Sea a strong N.W. gale and a low barometer raise the surface 2 or 3 feet higher,

and cause the tide to flow all along the coast from the Pentland Firth to London half an hour longer than the times and heights predicted in the

Tables. Easterly, S.E., and S.W. winds produce opposite effects, which will be felt as far down the Channel as Dungeness. On the contrary, at the entrance of the Channel, at Plymouth, and as far up as Scotland, south-westerly winds, with a low barometer, raise the surface of the water; and north-easterly winds and a high barometer always lower it.

The winds affect also the locality of the meeting of the North Sea and Channel tides: during moderate breezes this takes place somewhere between the North Foreland and the north end of the Goodwin Sands, and the southward, and between the Kentish Knock and the Galloper to the northward; but both these places of meeting are liable to be removed either south or north by strong northerly or south-westerly winds.

THE TIDES AMONG THE ORKNEYS.

BY COMMANDER F. W. L. THOMAS, R.N.

The great rapidity of the tidal streams among the Orkneys makes correct knowledge of their periods and velocities of the utmost importance to the mariner. *General Remarks.*

In the terrific gales which usually occur four or five times in every year, all distinction between air and water is lost, the nearest objects are obscured by spray, and everything seems enveloped in a thick smoke; upon the open coast the sea rises at once, and striking upon the rocky shores, rises in foam for several hundred feet, and spreads over the whole country.

The sea, however, is not so heavy in the violent gales of short continuance as when an ordinary gale has been blowing for many days; the whole force of the Atlantic is then beating against the Orcadian

shores, rocks of many tons in weight are lifted from their beds, and the roar of the surge may be heard for twenty miles; the breakers rise to the height of sixty feet, and on the North Shoal, which lies 8 miles N.W. of Costa Head, the broken sea is visible even at Skail and Birsá.

Similar effects may be witnessed in any stormy region, but here they are increased by the power of the tidal stream, and when the whole mass of water is in motion, a very slight inequality at the bottom of the sea is indicated by a ripple on the surface, so that by these means I have detected shoal spots (to the eastward of North Ronaldsha) at a depth of 47 fathoms, though the difference in depth was but 20 feet. On the rocky bank of the North Shoal, which is about 4 miles in length, the ripple readily distinguished any inequality of 10 and 15 feet, at a depth of 30 fathoms, even when the stream was moving but one mile per hour. It is only in calm or very fine weather that these rippings can be observed, but when the wind increases upon a weather tide the sea will break over every inequality of the sea bottom. These broken seas are dangerous, and during the survey of these Islands I have often been in great peril from moving the ship before sufficient time had elapsed for the sea to become quiet.

*Depth of the
Tidal Stream.*

*High water
at*

*Stromness,
Pierowall,*

Otters Wick,

Holm Sound.

The body of the tide-wave comes from the N.W., and makes high water on the whole west coast of the Orkneys at nearly the same time; the establishment for Stromness being 9 o'clock, and that for Pierowall in Westra, is about 6 minutes later. At the north-east end of the Orkneys it is but a few minutes later than at the north-west, as the establishment for Otters Wick is 9h. 13m.; but the tide there is probably retarded by having to pass over the shoal water at the mouth of the bay.

On the south-east side of the Orkneys, in Holm Sound, the high water there being derived from the tide-wave entering by the Pentland Firth takes place about 9h. 35m.

The vulgar establishment, or time of high water, full and new moon, varies greatly; the mean of nine observations at Otters Wick gives 9h. 13m., but they vary between 8h. 58m. and 9h. 42m.

*Difference of
Sea-level.*

When the tide has to pass through a narrow or shallow channel, the retardation is very great; thus it is high water an hour earlier at the mouth of Eynhallow Sound than at Kirkwall, though the distance is but 11 miles; and by levelling across Sanda (about half a mile), it appeared that when it was high water at Otters Wick, the sea-level was 4 feet 8 inches above the sea level of Catasand, and that high water was 1h. 43m. later at Catasand than at Otters Wick.

*Mean range at
North Isles.*

The mean range of tide at springs in the North Isles of the Orkneys is 11 feet 2 inches, and at neaps 5 feet 6 inches.

*Semidiurnal
inequality.*

Extraordinary springs may be 3 feet 4 inches above or below the mean; this result is greatly increased by the semidiurnal inequality; for in some instances the difference in the rise of two consecutive tides has been observed to amount to 2 feet 10 inches.

South Isles.

In the South Isles the mean range at springs is about 1 foot less than in the North, being 10 feet; at neaps 5 feet.

*Set of tide,
Mull of Papa.*

The passage from the westward round the North end of the Orkneys is rendered somewhat treacherous by the peculiar set of the tide; for the body of the flood stream coming from the north-west, a ship must be 6 or 7 miles to the northward of the Mull of Papa to drift clear of North Ronaldsha. The first half of the flood sets from the Mull right for North Ronaldsha (S.E. b. E. $\frac{1}{2}$ E.), and should the wind fail while the flood is running, there would be a great probability of drifting ashore.

*from Mull of
Papa to North
Ronaldsha.*

The flood stream passes slowly the North coast of Westra (sending a weak offset between Papa and Aikerness), and joins the main

run off Moul Head, where a bore or *röst** is formed, which stretches several miles to sea. The tide here runs about 6 knots; between Papa North Ronaldsha 3 knots; but near North Ronaldsha the rate increases to 6 knots, passing over the Altars of Linnay and Seal Skerry with great violence. The flood splits on the West coast of North Ronaldsha with the Established Kirk (the southernmost) in one small byre; and should a vessel be drifting down on the island, she should endeavour to pass to the southward, when she will go clear of everything.

*Bore off Papa,
Rate of Tide.*

Off Seal Skerry there is a bad *röst* with southerly winds, and the tide runs at six knots between that point and Dennis Head; it does not, however, touch the shore, but leaves a small eddy or counter-tide, where boats can turn up as far as the Skerry.

*Seal Skerry
Röst.
North
Ronaldsha.*

The tide sets strongly between Fair Isle and the Orkneys. For on one occasion having Dennis Head bearing S. $\frac{1}{4}$ E. distant 8 miles, the vessel having set S.E. $\frac{3}{4}$ S. for three hours, and being then high water on the shore, it shifted its direction $3\frac{3}{4}$ points; that is, it set South for the next three hours, or until it was half-ebb on the shore, its greatest rate having been 3 to 4 knots. An hour before this, the vessel's track began to take a curved form, which continued to grow sharper as the force of tide decreased, so that without any stopping, we found ourselves drifting with the ebb stream North, and parallel to, but at the distance of 2 miles from, our former track. The ebb stream continued steadily North for four hours, running 2·8 at its strength, after which it began to curve to the eastward; the stream thus appearing to describe a long spiral, and revolving in the direction of the hands of a watch.

*Tide Streams
between Fair
Isle and the
Orkneys.*

It also appears that when it is half-flood on the shore, it is slack water in the stream; that when it is low water on the shore, the flood-stream is running strongest, but changing its direction from S.E. $\frac{3}{4}$ S. to South, and that the reverse happens during ebb tide.

*Tide and half-
tide.*

These observations will show how little dependence can be placed on a direct course among these treacherous tides; and those who have been beating about for some days against a head wind are particularly exposed to this danger. It is a common remark with the people of North Ronaldsha, that all vessels come ashore with the flood ebb; and it is readily seen how this takes place, for the accident of it being either flood or ebb tide will make a difference of between 30 and 40 miles in position.

The flood stream from Runabrage sets into North Ronaldsha firth at the rate of 3 knots; from the Holms of Eyre it sets over the Baas of Evan, and both streams passing through the firth at the rate of 4 knots, continue to run two hours after high water on the shore.

*North
Ronaldsha
Firth.*

Off the Start the first of the flood sets to the southward at 4, but changes, as the stream grows older, to S.W. There is an extremely bad *röst* off the Start with southerly winds and flood tide; it stretching for 4 miles to sea, but being heaviest near the shore.

*Start of Sanda.
Röst.*

Between Westra and Sanda the stream is scarcely sensible, but gathering strength as it approaches Calf Sound and Lashy Sound, it rushes through those narrow passes at the rate of 6 knots; but decreasing to 2 or 3 knots in Eda Sound, where the stream falls into the Ronaldsha Firth. In those Sounds the stream runs $1\frac{1}{4}$ hours after it is high water on the shore.

*Calf and Lash
Sounds.*

In Spurness Sound the tide begins to the eastward half-an hour before it is low water on the shore, or $1\frac{3}{4}$ hours before it is low water in the stream, and turning every six hours. This stream is like a mill-race in

*Spurness
Sound.*

**röst* (pronounced reust) a Scandinavian word, meaning a roaring, broken, tidal sea.

the narrows when passing Spur Ness, but it speedily becomes in Sanda Sound, and off Kettletaft it scarcely runs 2 knots.

*Stronsa and
Westra Firths.*

In the Stronsa and Westra Firths, which form one continuous nearly straight channel, the tide stream is very rapid, as through Eynhallow Sound the body of the ocean tide is discharged.

North Shoal.

At the North Shoal, which is 15 miles from the entrance of the firth, the tide sets W. by S. (towards the entrance), and at springs runs 2 miles an hour; neaps about one.

*Brough of
Birsa.*

Along the coast of West Mainland, or Pomona, the stream is not so sensible off the points; but off the Brough of Birsa the flood sets to the northward for two hours after it is high water on the shore, when its greatest rate is 2 knots.

*West coast of
Rowsa.*

From the Brough of Birsa the flood sets along shore for Calf Sound, past Sacquoy Heads, increasing in velocity as it approaches the Westra Firth. The influence of the indraught through Eynhallow Sound is scarcely felt beyond a line joining Costa Head and the Reef of Gairisa.

Skea Skerries

The flood stream runs South along the West coast of West Mainland to the Noup to the point of Skea, and over the Skea Skerries.

*Kili Holm.
War Ness.*

Between them and Rowsa the stream acquires great force, even 6 knots. It does not turn for two hours after high water on the shore. The weight of the flood passes close round Kili Holm, and crosses for War Ness (South Point of Eda,) and the Greenholms.

Stronsa Firth.

At War Ness the tide stream runs 7 knots, and the current is not so passable during southerly gales and spring flood. At that time the Sound between the Gio Ness of Shapinsha and War Ness is in great commotion, and when bound to Stronsa, a line of breakers may sometimes be seen roaring and foaming within half a cable's length, vainly looking for a gap or smooth.

The main stream from War Ness, joined by the Stream from Eda, sets past Rousholm Head, and clear of Auskerry to the open sea. It comes from the Greenholms, past Shapinsha and Deerness, where it is called by the String, the usual name for the direct run of the stream from Eynhallow Sound by Gairisa, Eller Holm, and Deerness. Its rate between Shapinsha and Rousholm is 6 knots, and between the Mull of Gairisa and Auskerry about 4 knots.

*Weatherness
and Fara Ness
Sounds.*

The tides in Weatherness and Fara Ness Sounds are peculiar. The flood stream turns to the eastward as soon as the tide has ceased to rise on the shore; that is, the flood stream makes $2\frac{1}{2}$ hours before it reaches the Westra Firth. The stream pours through the narrows of Weatherness and Fara Ness Sounds at the rate of 4 knots, and then sets very rapidly towards Calf Sound.

*Egilsha and
Shapinsha.*

A very weak stream runs south through Howan Sound during the flood, and it is also weak on the East side of Egilsha; for the body of the stream goes transversely across the channel, and leaves comparatively still water along Egilsha and the North side of Shapinsha.

*Eynhallow
Sound.*

The flood stream from Costa Head and the reef of Queneo runs towards Eynhallow, and divides there, passing Burgher and the Race at the rate of 7 knots; the streams unite when past the Race, but do not average more than 4 knots down Eynhallow Sound.

*Wyre Sound.
Swine Holm.*

A very weak stream passes eastwards through Wyre Sound, and another South of Wyre island; but off Swine Holm, where the flood stream unites with that from the Westra Firth, the rate scarcely exceeds 2 knots. In the narrow channels among the group of Holms, between Gairisa and Shapinsha, the flood sets southerly 6 knots.

*Between Gairisa
and Shapinsha*

*and by Work
Head.*

The main stream from Eynhallow Sound passes S. of Gairisa, and thence transversely to Stromberry Head, and on through Strom Sound. The tide stream is narrow in its passage between Work Head and Eller Holm, nor does the *String* expand for some distance.

passing that place; the rate at springs is about 3 knots, and the stream does not turn till 1½ hours after high water on the shore.

The flood-stream running through Hoy Sound commences on the North Side at the Millstone Quarry, 4 miles from Hoy Mouth, and on the South from Hoy Head; the indraught is scarcely felt 5 miles outside the entrance. Hoy Sound.

In Hoy Mouth the rate of the stream is 4 knots, until it divides upon Gremsa, when the rate increases to 6 knots; one stream passing through Burwick Sound, the other between Gremsa and Stromness. Burwick Sound.

The tide goes over the Skerry Ness, and from thence sets fair for the skerries of Clestron, where it divides, one stream running up and filling the Bay of Irland, and at half flood setting as a back-tide out of Airston Road; the other setting rather off shore at first, and then towards Houton Head. From Burwick Sound the stream sets along the shore of Hoy to Green Head, the rate being scarcely 3 knots; and Gremsa causes a large arrear of slack water in the middle of the Sound. Houton Head.

After passing Houton Head, the flood stream becomes diffused in Scapa Flow, and is only sensible off that point; its general direction towards Holm Sound, and at the Barrel of Butter it scarcely runs 3 knots at springs. On the West side of Holm the stream drains along shore to Halcrow Head, where it meets the stream from the Pentland Firth. Scapa Flow.

The tide stream runs with greater velocity and turbulence through the Pentland Firth than in any other part of the Orkneys; so that with a strong gale and a weather spring-tide the sea is in many places impassable, and after the wind has gone down, the sea continues to break with great violence for some days, indeed in a sailing ship more danger to be apprehended from a calm than from a gale of wind. The tide wave from the Atlantic, opposed by the West coast of the Orkneys, is pressed against the shores of Caithness, where at Thurso the tide rises nearly 5 feet higher than at Stromness, though the latter is but 20 miles to the northward. This accumulated mass of water finds egress through the Pentland Firth, where the velocity of the stream near the Little Skerry, as said by Captain Otter to have acquired the rate of 10 knots. At the Great and Lothar Skerries, which resist a large body of the tidal stream, the water is sensibly higher by 1 or 2 feet upon the stream bed, and a small rapid is formed, of little height indeed, but of great power. Vessels that have drifted upon this rock, when covered by the tide, have been rolled over it, and sunk in deep water on the other side. Pentland Firth.

The establishments of the following places in the Pentland Firth were determined by Captain Otter:—

Establishments.

PLACES.	High Water.		Rise above the Spring L.W.				Range, or Rise between L.W. and H.W.				REMARKS.
			Spring.		Neap.		At Springs.		At Neaps.		
	h.	m.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	
Thurso, Scrabster Road -	8	28	14	10	11	0	14	10	5	6	Deduced from 4 years observations.
Uncansby Ness -	10	14	10	0	8	6	10	0	4	0	Mean of 19 comparisons, but very irregular.
Stroma, South Side -	9	47	9	0	7	6	9	0	4	0	Mean of 12 comparisons with Thurso.
Stroma, East Side -	10	24	-	-	-	-	-	-	-	-	
West Side -	9	35	-	-	-	-	-	-	-	-	
Antland Head, Great Skerry, East Side -	11	4	9	3	8	0	9	3	3	0	Mean of 33 comparisons with Thurso.
Great Skerry, West Side -	10	53	-	-	-	-	-	-	-	-	
Idowall -	9	3	-	-	-	-	-	-	-	-	Mean of 7 comparisons with Thurso.

The directions as well as the velocities of the tidal streams Pentland Firth vary with the hour of the tide; and in almost all cases the flood takes a more southerly direction as the tide grows and the contrary with the ebb.

Rate. The flood stream comes South along the shore of Hoy, and East along the coast of Caithness; and the indraught increases in approaching the entrance. Between Turn Ness and Dunnet Head the usual rate is 7 knots, but as they round the South end of Swona at the end of Stroms, it rises to 9 knots, and when rushing past the Great Lothar to 10. About $1\frac{1}{2}$ hours after it is high water on the shore, the flood stream makes strong along the coast of South Wona, curving to the northward of Swona, washes the Great Lothar, and passes to the northward of the Pentland Skerries.

Direction. At a later period of the tide, the stream from Brims Ness goes to the South end of Swona and to the Southward of the Pentland Skerries; so that after it is half flood in the stream (equal to high water on the shore), if a ship is a mile to the southward of Brims Ness, she may pass a mile to the southward of Swona, and the same distance southward of the Skerries.

Hoxa Sound. From Cantick Head the flood stream sets past Stangar Head, crossing Hoxa Sound divides on the Lime Kiln; one very weak stream setting to the southward along South Ronaldsha, while the other goes at about 4 knots towards Water and Holm Sounds.

Holm Sound. Through Holm Sound the rate of the stream is 6 knots where it is strong, and it turns at one hour after it is high water on the shore. Through Water Sound is 4 knots.

Water Sound. From Cantick Head a weak stream runs northwards, filling Hope and the bays on the east side of Hoy, and finding outlets through Gutter and Weddel Sounds; the rate at springs in the narrowest of these Sounds is 2 knots.

Cantick Sound. Between Cantick Head and Swona the general direction of the stream is towards South Ronaldsha, and southward between it and Barth Head, but it is almost impossible to predict exactly what direction a vessel would take; with Barth Head open North of Swona, at quarter flood would send her to the northward of that island, and at half flood to the mid-channel between it and South Ronaldsha; but the flood would probably press her too close to Barth Head, and prevent her passing the Great Lothar.

East side of Hoy. The first of the flood stream from Widewall sets direct for Barth Head and the Lothar, so that in light winds vessels should in passing pass as near to the North Head of Swona as possible. As a rule, if a ship, having left Widewall with light winds and flood, should drift nearer to Swona than Barth Head, she will be clear of the Lothar—if nearer to Barth Head, she will go too close to the rock.

Pentland Firth; round Swona ; When the flood stream first makes at the north head of Swona, it first sets across the channel, but presently turns to the southward, clear of the Lothar, and then to the northward of the Pentland Skerries; but after half flood in the stream, equal to high water on the shore, the stream from the north end of Swona bends round to the southward of these islands, and consequently, at a certain period of the tide, sets towards them.

Pentland Skerries. Between the Lothar and the Skerries the flood stream sets far from sea, about E.S.E., joining the main stream from Stroms Firth.

From the South end of Swona the first flood sets right on to the North Skerry, dividing there, and running 7 knots close to the North Skerry. On the South side the stream sets off (leaving a narrow eddy in the middle) first towards the Little Skerry; but it gradually curves and goes

stream off Moul Head, where a bore or *röst** is formed, which stretches several miles to sea. The tide here runs about 6 knots; between Papa and North Ronaldsha 3 knots; but near North Ronaldsha the rate again increases to 6 knots, passing over the Altars of Linnay and Seal Skerry with great violence. The flood splits on the West coast of North Ronaldsha with the Established Kirk (the southernmost) in one with a small byre; and should a vessel be drifting down on the island, she should endeavour to pass to the southward, when she will go clear of everything.

*Bore off Papa,
Rate of Tide.*

Off Seal Skerry there is a bad *röst* with southerly winds, and the tide runs at six knots between that point and Dennis Head; it does not, however, touch the shore, but leaves a small eddy or counter-tide, where boats can turn up as far as the Skerry.

*Seal Skerry
Röst.*

*North
Ronaldsha.*

The tide sets strongly between Fair Isle and the Orkneys. For on one occasion having Dennis Head bearing S. $\frac{1}{4}$ E. distant 8 miles, the flood having set S.E. $\frac{3}{4}$ S. for three hours, and being then high water on the shore, it shifted its direction $3\frac{3}{4}$ points; that is, it set South for the next three hours, or until it was half-ebb on the shore, its greatest rate having been 3 to 4 knots. An hour before this, the vessel's track began to take a curved form, which continued to grow sharper as the rate of tide decreased, so that without any stopping, we found ourselves drifting with the ebb stream North, and parallel to, but at the distance of 2 miles from, our former track. The ebb stream continued steadily North for four hours, running 2.8 at its strength, after which it began to curve to the eastward; the stream thus appearing to describe a long oval, and revolving in the direction of the hands of a watch.

*Tide Streams
between Fair
Isle and the
Orkneys.*

It also appears that when it is half-flood on the shore, it is slack water in the stream; that when it is low water on the shore, the flood-stream is running strongest, but changing its direction from S.E. $\frac{3}{4}$ S. to South, and that the reverse happens during ebb tide.

*Tide and half-
tide.*

These observations will show how little dependence can be placed upon a direct course among these treacherous tides; and those who have been beating about for some days against a head wind are particularly exposed to this danger. It is a common remark with the people of North Ronaldsha, that all vessels come ashore with the flood tide; and it is readily seen how this takes place, for the accident of it being either flood or ebb tide will make a difference of between 30 and 40 miles in position.

The flood stream from Runabrage sets into North Ronaldsha firth at the rate of 3 knots; from the Holms of Eyre it sets over the Baas of Trevan, and both streams passing through the firth at the rate of 4 knots, continue to run two hours after high water on the shore.

*North
Ronaldsha
Firth.*

Off the Start the first of the flood sets to the southward at 4, but changes, as the stream grows older, to S.W. There is an extremely bad *röst* off the Start with southerly winds and flood tide; it stretching 3 or 4 miles to sea, but being heaviest near the shore.

Start of Sanda.

Röst.

Between Westra and Sanda the stream is scarcely sensible, but gathering strength as it approaches Calf Sound and Lashy Sound, it rushes through those narrow passes at the rate of 6 knots; but decreasing to 2 or 3 knots in Eda Sound, where the stream falls into the Stronsa Firth. In those Sounds the stream runs $1\frac{1}{4}$ hours after it is high water on the shore.

*Calf and Lash
Sounds.*

In Spurness Sound the tide begins to the eastward half-an hour before it is low water on the shore, or $1\frac{1}{4}$ hours before it is low water in the stream, and turning every six hours. This stream is like a mill-race in

*Spurness
Sound.*

* *Röst* (pronounced reust) a Scandinavian word, meaning a roaring, broken, tidal sea.

during ebb tide, which before the tide is done almost reaches as far as Cantick Head.

*Eddy of
Stroma.*

The ebb stream sets fairly through the Firth from the North end of Stroma till it meets the stream coming from Inner Sound and incloses a large eddy ; at half tide these united streams set over toward Turn Ness, where the last of the ebb tide drains, while there is comparatively still water on the South side, between Dunnet Head and St. Johns Point.

It does not appear necessary to follow the course of the ebb stream throughout the Orkneys, as in almost every case it is the reverse of the flood, nor to enter into detail of those phenomena which are common to all masses of water in motion, and which any one, by observing the directions of the channels and the apparent obstructions of the several streams, can learn from the chart.

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*The Common
Standard for
the turn of the
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A CAREFUL investigation of the tides in the Irish Channel, the English Channel, and in the North Sea, has shown the possibility of referring the movements of the several streams to a common standard, instead of resorting to the troublesome process hitherto in use, of comparing the motion of the streams with the varying times of high water along the coast.

*is High Water
at Dover and
Liverpool.*

For the entrance of the English Channel and North Sea the time of high water at Dover may be considered the standard ; and for the whole of the Irish Channel, the time of high water on the shore at the entrance of Liverpool.

*Off mouth of
English
Channel.*

Off the mouth of the English Channel the stream, although materially influenced by the indraft and outset of the Channel, will be found running to the *northward and eastward*, while the water is *falling* at Dover ; and to the *southward and westward* while it is *rising* at that port. The particular direction given to the stream in this part of the sea, by the meeting of the Channel and of the offing tides, will be shown in the following table (Compartment I.) ; and it is only necessary to mention here, that to the southward of the parallel of Scilly, the tides of the Channel and offing blend together with varying force and direction, and occasion the stream to be constantly changing, and in some places even to make the entire circuit of the compass in one tide, without ever remaining long upon any one point. So that any written description of their course is rendered almost impossible, and the table alone must be consulted for the direction at any particular hour. From this revolving motion of the stream, it has been asserted that a vessel can never be carried far in any one direction by the tide. Such, however, is not the case ; for, although it may be true that while at anchor in a particular spot the vessel's head will turn to every point of the compass, yet directly she is loose she will be carried away upon a rhomb depending upon the state of the tide at Dover.

South of Scilly.

Bristol Channel.

From the parallel of Scilly to the Bristol Channel the stream is more regular, and while the water is *falling* at Dover, will be found setting to the *northward* : near the coast partaking of the direction of the shore, and turning sharply round Trevoise Head and Hartland Point into the Bristol

annel; and while the water is *rising* at Dover, setting as sharply out the Bristol Channel and along the land towards Scilly.

By many observations, the Light vessel at the Seven Stones has been found to swing to the *northern* tide 7 minutes after high water at Dover; but at Trevoose Head the northern tide to make 12 minutes after Dover. And as a vessel advances up the Bristol Channel the stream turns progressively later. The tides of that estuary do not follow the same law exactly as the tides of channels which are open at both extremities. The directions of the stream in the Bristol Channel will be given hereafter; but present I wish to draw the attention of the seamen to the particular fact, that while the stream from Scilly is setting to the *northward* the stream from the Irish Channel will be found setting to the *southward*, and that these streams meet off the entrance of the Bristol Channel in about a parallel of $51^{\circ}00'$ where both turn into that channel. As a general rule, in all the space eastward of a direct line joining Scilly and the Tuskar, the stream will be found running to the eastward towards the Bristol Channel, while the water is *falling* at Dover and Liverpool, and *vice versa*, setting to the *north-east* on the southern side of the Channel and to the *south-east* on the northern side. Such is the general set of the stream in this part of the sea, which I have given in general terms to show that to the eastward of the line above mentioned a strong indraft towards the Bristol Channel will always be experienced while the water is *falling* at Liverpool, and *vice versa*. To the westward of this line the stream appears to be slack; but we are in want of further observations in this part before any particulars can be entered into. Towards Cape Clear the northern stream from Scilly seems to join the southern and western streams from the Irish Channel, and both pass to the north-west and Cape Clear, and *vice versa*.

Seven Stones.

Meeting of the
Stream in
 $51^{\circ} N$.

Streams between
Scilly and
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At the Smalls Lighthouse it is slack water 5 minutes before high water at the entrance of Liverpool; the stream sets past the rock S. by W. $\frac{1}{2}$ W. direction while the water is *falling* at Liverpool, N. by E. $\frac{1}{2}$ E. while it is *rising* there, veering to N. by E. during the two last hours of the tide. The strength of the tide is sensibly felt about and all the way from the Smalls to Pembroke, running upwards of $3\frac{1}{2}$ or 4 knots at the height of the springs. To the southward of the Smalls the stream sweeps round in a broad curve to the S.E., and enters the Bristol Channel while the water is *falling* at Liverpool and *vice versa*, as before stated. The *entrance of Liverpool* is properly the standard to which the turn of the stream in these pages is referred, wherever a reference is made to that place it must be understood as being 18 minutes *earlier* than the time of high water at St. Georges, to which the tide tables are adapted.

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On the Irish side, at the Saltees Lightship, for instance, the water slack 22 minutes before it is high water at Liverpool entrance. The stream sets W.S.W. from a quarter of an hour before high water at Liverpool entrance to $1\frac{1}{4}$ hours after, and then W.N.W. to low water. At flood or *rising tide* at Liverpool sets past the Saltees for the 3 hours E. by S., then E.S.E. for the 2 next hours, and S.E. by E. the last hour, when the tide slacks, as before, 22 minutes before high water at Liverpool entrance.

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From the Saltees Lightvessel to the Tuskar the stream sets along the land, but towards Carnsore Point begins to tend to the northward on flood, and finally sets sharply round that point into the Irish Channel, and must be carefully watched by vessels in this situation.

Off Carnsore
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Meeting of the Stream in $51^{\circ} N.$

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Off Carnsore Point.

SECTION I.

THE TIDAL STREAMS OF THE IRISH CHANNEL, WITH
SHOWING THEIR COURSE AND RATE WHEN AT THEIR
STRENGTH.

*Streams turn
with the tides
of Liverpool
and Morecambe
Bay.*

IN the Irish Channel, as before observed, experiments have shewn notwithstanding the variety of times of high water throughout the Channel, the turn of the stream over all that part which may be a fair navigable portion of the Channel is nearly simultaneous in both northern and southern streams in both Channels commencing at all parts (practically speaking) at nearly the same time; and the time happens to correspond nearly with the time of high and low water at the shore at the entrance of Liverpool and of Morecambe Bay, remarkable as being the point where the opposite tides coming from the extremities of Ireland terminate. So that it is necessary to know the times of high and low water at either of these places to determine the hour when the stream of either tide will commence in any part of the Channel. For this purpose the tide-table may be used, subtracting 18 minutes from the time given, in consequence of the high water at St. Georges Pier being 18 minutes earlier than the point which is considered as the head of the tide, as will be found fully explained at page 125.

*Streams enter
N. and S. of
Ireland.*

The tide from the Atlantic enters the Irish Channel by two openings, of which Carnsore Point, the S.E. point of Ireland, and Lundy Head, the S.W. point of Wales, are the limits of the southern Channel; Rathlin and the Mull of Cantyre the boundaries of the northern Channel.

*Southern
streams from
Tuskar to the
Isle of Man.*

The central portion of the stream of flood or ingoing stream runs nearly in a line from a point midway between the Tuskar and the Mull of Cantyre to a position 16 miles due west of Holyhead; beyond which it expands eastward and westward; but its main body preserves its direction straight forward towards the Calf of Man, which it passes towards with increased velocity as far as Langness Point, and then at a more moderate rate on towards Maughold Head. Here it meets by the flood or southern stream from the North Channel coming from the Point of Ayr, and is first turned round to the eastward and then goes on with it at an easy rate direct for Morecambe Bay, changing its direction nearly eight points.

*Eastern Branch
of S. stream sets
into Cardigan
Bay.*

The outer portions of the stream are necessarily deflected from the course of the great body of the water by the impediments on the Irish side of the Channel, and by the tortuous form of the coast of the Welsh. The eastern portion passing Linney Head, rushes rapidly between the Smalls, Grassholm, and Milford Haven to Bishopscote, which it passes at a rate of between 4 and 5 knots; and then round those rocks in an E.N.E. direction right over the Bass into Cardigan Bay; makes the circuit of that Bay, and sets out towards Bardsey, at the other extremity of it; then sweeps N. by W. past the island and through the Sound, it gradually follows the course of the shore, round Caernarvon Bay, filling the Mersey as far as Bangor; but the stream still continuing outside to South Stack, which it rounds, setting towards the Skerries at upwards of 4 knots; and, finally, turns sharp round those

* The entrances of Liverpool and of Morecambe Bay are, as before shewn, 18 minutes earlier in their times of high water, than those given for Liverpool tables.

Liverpool and Morecambe Bay; completing in its way the high water in the Menai, and filling the Dee, the Mersey, and the Ribble.

The *western portion of the stream*, after passing the Saltees, runs nearly in the direction of the Tuskar, sets sharply round it, and then takes a N.E. $\frac{1}{2}$ N. direction, setting fairly along the coast, but over the banks skirting the shore, so that vessels tacking near the inner edge of the sands on the flood, and on the outer edge on the ebb, have been carried upon them and lost, especially upon the Arklow and Codling Banks. Abreast of the Arklow is situated that remarkable spot in the Irish Channel, where the tide scarcely either rises or falls. The stream notwithstanding sweeps past it at the rate of 4 knots at the springs, and reaches the parallel of Wicklow Head. Here it encounters an extensive projection of the Codling bank; and while the outer portion takes the circuit of the bank, the inner stream sweeps over it, occasioning an over fall and strong rippling all round the edge, by which the bank may generally be discovered. Beyond this point the streams unite and flow on towards Howth and Lambay, growing gradually weaker as they proceed, until they ultimately expend themselves in a large space of still water situated between the Isle of Man and Carlingford. There we have not been able to detect any stream; for there another remarkable phenomenon occurs—the water rising and falling without having any perceptible stream. This space of still water is marked by a bottom of blue mud. Such is the course of the flowing water of the Southern Channel.

Western Branch sets over the Irish banks.

Off Arklow, no rise or fall.

Codling Bank.

Stream ends off Carlingford. No stream there.

In the North Channel the stream enters between the Mull of Cantyre and Rathlin Island simultaneously with that passing the Tuskar into the Southern Channel, but flows in the contrary direction. It runs at the rate of 3 knots at the springs, increasing to 5 knots near the Mull, and to 4 near Tor Point on the opposite side of the channel. The eastern branch of this stream turns round the Mull towards Ailsa and the Clyde, a portion passing round Sanda up Kilbrennen Sound and Loch Fyne. The main body sweeps to the S. by E., taking nearly the general direction of the Channel, but pressing more heavily on the Wigtonshire coast; off which it has scooped out a remarkable ditch, upwards of 30 miles long by about a mile only in breadth, in which the depth is from 70 to 100 fathoms greater than that of the general level of the bottom about it. Near the Mull of Galloway the stream increases in velocity to 5 knots; the eastern portion turns sharply round the promontory towards the Solway, and splits off St. Bees Head, one portion running up the Solway, and the other towards Morecambe Bay.

Northern Stream from Rathlin to the Clyde.

The *central portion* midway between the Mull of Galloway and the Copeland Island presses on towards the northern half of the Isle of Man; and while one portion of it flows towards the Point of Ayr, the other makes for Contrary Head, and is there turned back to the N.E. at a right angle nearly to its early course. Passing Jurby Point, it re-unites with the other portion of the stream and they jointly rush with a rapidity of from 4 to 5 knots round the Point of Ayr, and directly across all the banks lying off there, and catching up the stream from the south channel off Maughold Head, they hurry on together towards that great point of union, Morecambe Bay. This bay, the grand receptacle of the streams from both Channels, is notorious for its huge banks of sand, and also remarkable for a deep channel scoured out by the stream, and known as the Lune Deep, which is the great beacon to all vessels bound to that place.

Central portion of this stream sets to Isle of Man and Morecambe Bay.

Lune Deep.

We have now only to speak of the *western limit* of the stream, which was left off Tor Point running at a rate of 4 knots off the pitch of the point. Hence it strikes directly towards the Maidens, boiling over the Highlander and Russel Rocks, and other reefs in the vicinity of that

Western branch of N. stream to Maidens and Belfast.

dangerous group ; and takes the direction of the coast again from Island to Black Head, at the entrance of the Lough of Belfast, fills.

Belfast Lough. The portion of the stream which sets into Belfast Lough at Grey Point ; one portion flowing up towards Garmoyle, while the other bends back along the shore of Bangor, Groomsport, and Orkney, and blends with the general stream which has come on from the Maidenhead in nearly a straight line, and passes with it through the sounds of the Copeland Islands. Hence it proceeds along the coast, brushes the South Rock, and runs on towards St. John's Point, where the stream, like that coming from the southward, expands into the large space of still water, which remains almost undisturbed, although pressed upon by streams from various quarters.

Ingoing Streams. Such is a general description of the streams in the Irish Channel, which are produced by the flowing of the water, or which, for the purpose of distinction, we may designate the *inging streams*.

Outgoing Streams. The ebbing or *outing streams* do not materially differ from the reverse of those, except that in the southern channel they preponderate more over towards the Irish coast.

Limits of the above Streams. These observations do not, however, extend beyond the point where the Channels begin to open out, that is, beyond a line joining the Mull of Cantyre on the North, and the Saltees and Pembrokeshire on the South. Outside of these limits, the waters diverge right and left ; that on the north joining the stream from Jura, and turning shallows round Rathlin ; that on the south, speaking now of the outgoing stream, passing past St. Davids Head into the Bristol Channel on one side, and the other rounds the Tuskar, and passes on to Waterford.

SHOWING THE MAGNETIC DIRECTION AND RATE (AT SPRINGS)
OF THE TIDAL STREAMS IN THE IRISH CHANNEL.

the following Table, the direction of the stream as it runs at the *Explanation.*
e of the tide or at its greatest strength, is given at four places upon
connecting well known headlands, viz., at 5 miles from the shore,
ch side of the channel, and at a third of the distance across the
el from each of those headlands. The names of the places will
nd in the marginal columns; and in the adjacent column, a brief
ption of the course of the streams in the immediate vicinity of each
nd. The western part of the stream will be found on the left-
page, and the eastern half on the right-hand page.

use the table, take the line nearest to your position, and at the
ce across the Channel which answers best to your distance from
nd, take out the direction of the stream from its column; or if
ace of the ship falls between two divisions, take the mean of the
irections given in the columns for the direction of the stream at
ime. To know when the stream will turn, look in the Tide
s for the time of high water at Liverpool, for the day, and about
utes after that time the stream will begin to *set out* in both
orth and the South Channels, and will run in that direction until
45 minutes before low water, when the general slack water begins.
lack water in the offing is usually spread over an interval of an
-from the cessation of one stream to the beginning of the next.

these tables { F stands for *flood* or *rising* tide at Liverpool.
E stands for *ebb* or *falling* tide at Liverpool.

a rough general rule, in the fair way of the Channel a vessel will
ried 9 miles by the stream in a whole tide at springs, and at neaps
6 miles; but near to the land on either side, or to the banks,
e of the stream greatly increases.

rates given in the table which follows are at spring tides; and in
o adapt them to neaps, one third may be subtracted from them.

dangerous group ; and takes the direction of the coast again from Muck Island to Black Head, at the entrance of the Lough of Belfast, which it fills.

Belfast Lough. The portion of the stream which sets into Belfast Lough splits off Grey Point ; one portion flowing up towards Garmoye, while the other bends back along the shore of Bangor, Groomsport, and Orlock, and blends with the general stream which has come on from the Maidens and Blackhead in nearly a straight line, and passes with it through the sounds of the Copeland Islands. Hence it proceeds along the coast, brushes the South Rock, and runs on towards St. Johns Point; off which the stream, like that coming from the southward, expends itself in the large space of still water, which remains almost undisturbed, although pressed upon by streams from various quarters.

Ingoing Streams. Such is a general description of the streams in the Irish Channel, which are produced by the flowing of the water, or which, for the purpose of distinction, we may designate the *inging streams*.

Outgoing Streams. The ebbing or *outgoing streams* do not materially differ from the reverse of those, except that in the southern channel they press rather more over towards the Irish coast.

Limits of the above Streams. These observations do not, however, extend beyond the points where the Channels begin to open out, that is, beyond a line joining Rathlin and the Mull of Cantyre on the North, and the Saltees and Pembroke on the South. Outside of these limits, the waters diverge right and left; that on the north joining the stream from Jura, and turning sharp round Rathlin ; that on the south, speaking now of the outgoing stream, sweeps past St. Davids Head into the Bristol Channel on one side, and on the other rounds the Tuskar, and passes on to Waterford.

Of the TIDAL STREAMS in the IRISH CHANNEL.

Of the Stream.					Remarks on the Tides near the Land.	Position.	
	$\frac{1}{2}$ over.		5 Miles.	From			
F	N.E. $\frac{1}{2}$	Rate. 2 $\frac{1}{2}$	N.E. $\frac{3}{4}$ E.	Rate. 3 $\frac{1}{2}$ to 4	St. Davids Head.	The stream curves with the land, and the flood sets sharply into Cardi- gan Bay, sweeping more consequently an in-draught	On a line join- ing St. Davids Head and the Tuskar.
E	S.W. $\frac{1}{2}$ W.	2 $\frac{1}{2}$	S.W. $\frac{3}{4}$ W.	4			
and more in as you near the land. There is consequently an in-draught into this bay on both ebb and flood.							
F	N.E. by N.	3 $\frac{1}{2}$	N.N.E. $\frac{1}{2}$ E.	3	Bardsey Island.	The stream curves sharply round Bardsey, and slacks 1h. 20m. in the Bardsey	On a line join- ing Bardsey Island and the Arklow Light Ship.
E	S.W. $\frac{3}{4}$ S.	3	S.S.W. $\frac{1}{2}$ W.	2 $\frac{1}{2}$			
Sound before it does in the offing; the flood setting strong into Caernar- von, and the ebb strong into Cardigan Bay, and <i>vice versa</i> .							
F	N.N.E. $\frac{3}{4}$ E.	2 $\frac{1}{2}$	N. by E. $\frac{1}{2}$ E.	3 $\frac{1}{2}$	Holyhead -	In passing Caernarvon Bay the stream curves with the bay more and more as you near the bight, setting into the bay on one side and out at the other end, near Holyhead Bay; the stream sets directly for the Skerries, sweeping into Holyhead Bay when inside a line, joining the North Stack and Skerries, and in the centre of the bay splits, one part setting sharply over the Platters and round Carmel Head, the other running for the Fenwick Rock and Penryn.	On a line join- ing Holyhead and Kish Light Ship.
E	S.W.	2 $\frac{1}{2}$	S.W. $\frac{1}{2}$ S.	3			

first quarter ebb and flood, at first close in with the shore, and gradually increases in strength, extending to seaward in a direction between N.W. and W.S.W. from the lighthouse, according to time of tide; about the last quarter tide it begins to subside. With strong winds blowing against the tide, the race is heavy, especially about half tide, and even dangerous at that time to small deep laden vessels, so that they should either go outside altogether or pass between it and the Stack (close to the latter). North and N.W. winds occasion the heaviest seas; at a distance of 2 miles from the Stack the race is no longer felt, and by keeping the Skerries to the eastward of N.E. by E. $\frac{1}{2}$ E. a vessel will pass outside of it. Off the North Stack also there is a race after half tide, and although not dangerous at any time, it had better be kept clear of in heavy weather, as the seas break short.

Of the Stream.					Remarks on the Tides near the Land.	Position.	
	$\frac{1}{2}$ over.		5 Miles.	From			
F E	East W. by S.	Rate. 2 1 $\frac{1}{2}$	E. $\frac{1}{2}$ N. W. $\frac{3}{4}$ S.	Rate. 3 3	Skerry Lighthouse.	From the Skerries the stream sweeps over the Coal Rock, and runs on thence to Lynus and Liverpool in nearly a direct line; but at 10 miles off shore it takes a more northerly direction, and strikes off for the Ribble and Morecambe Bay; near Lynus it curves to the southward, and runs for Priestholm and Great Orme Head; at half tide the stream slacks in Red Bay, and turns to the northward, and off Lynus meets the true tide, and forms a race.	On a line join- ing the Sker- ries and the Calf of Man.
F E	E. $\frac{3}{4}$ N. W. by S.	1 $\frac{1}{2}$ 1 $\frac{1}{4}$	S.E. by E. N.N.W. $\frac{1}{4}$ W.	2 1 $\frac{1}{4}$	Calf of Man	Near the Calf, and to the northward, the flood sets to the southward, and the ebb to the northward; between the Calf and Rockabill the stream is very slack, being scarcely perceptible midway.	On a line join- ing the Calf of Man and Rockabill.

TIDAL STREAMS

TABLE showing the DIRECTION and RATE (at SPRINGS)

Position.	Remarks on the Tides near the Land.	Magnetic Direction				
		From	5 Miles.	$\frac{1}{2}$ over.		
On a line joining the Tuskar and St. Davids Head.	The stream curves with the land and slacks in shore $1\frac{1}{2}$ hours before the offing, and inside the Long Bank $2\frac{1}{2}$ hours before Liverpool, the stream setting over the bank N. by W. & S. W.	Tuskar -	N.E. $\frac{3}{4}$ E. S.W. $\frac{3}{4}$ W.	Rate. 3 3	N. E. by E. $\frac{1}{4}$ E. s. w. by w. $\frac{1}{4}$ w.	Rate. $2\frac{1}{2}$ $2\frac{1}{2}$ F E
On a line joining the Arklow Light Ship and Bardsey Island.	Near the Arklow bank the stream slacks half an hour before it does in the offing, and inside the Banks generally an hour and upwards before the offing.	Arklow Light Ship.	N.E. $\frac{1}{2}$ N. S.W. by S.	3·6 3·6	N.E. $\frac{1}{2}$ N. S.W. $\frac{1}{2}$ S.	$3\frac{1}{2}$ $3\frac{1}{2}$ F E
On a line joining the Kish Light Ship and Holyhead.	The stream slacks at the Kish upwards of half an hour before the offing, and then bends inwards, towards the bay, setting over the Kish bank; further in shore it turns $1\frac{1}{2}$ hours before the offing, and 2 hours close in shore.	Kish Light Ship.	N.N.E. S.S.W. $\frac{1}{4}$ W.	2·0 2	N.N.E. S.S.W. $\frac{1}{4}$ W.	$2\frac{1}{2}$ $2\frac{1}{2}$ F E

In approaching Holyhead be guarded against the tides which run very strong near the Headlands.

At 7 miles off the South Stack the stream runs $2\frac{1}{2}$ knots at springs.
At 5 miles ditto ditto 3 to $3\frac{1}{2}$ knots at springs.
At 2 miles ditto ditto 5 knots at springs.

The neaps run about two thirds of these rates. In the channel the direction of the flood is about N.E. by N., and near the Stack N.E. or N.E. $\frac{1}{2}$ E. towards the Skerries. Off the Skerries, that is, outside them, the flood turns more easterly, or runs E.N.E., and to the northward of the Skerries due east, or E. $\frac{1}{2}$ N.

Off the South Stack there is a race occasioned by the meeting of the tides, but increased by some uneven rocky ground off the Stack. It begins about the

Position.	Remarks on the Tides near the Land.	Magnetic Direction				
		From	5 Miles.	$\frac{1}{2}$ over.		
On a line joining the Calf of Man and the Skerries.	The flood stream meets the northern stream close to the Calf, and both run along the land to the eastward.	Calf of Man.	E. $\frac{3}{4}$ S. W.N.W. $\frac{1}{2}$ W.	Rate. $2\frac{1}{2}$ $2\frac{1}{2}$	E. $\frac{1}{2}$ N. W. $\frac{1}{2}$ S.	Rate. $1\frac{1}{2}$ $1\frac{1}{2}$ F E
On a line joining Rockabill and the Calf of Man.	From Rockabill to the northward the stream sets fair, taking nearly the direction of the coast, and passes on to St. Johns Point, when it encounters the stream from the North Channel; near here the stream turns to the westward, and bends in taking the curve of Dundrum Bay, which must be guarded against.	Rockabill -	N. by E. S. by W.	1·0 $1\frac{1}{4}$	N.E. $\frac{1}{2}$ E. S.S.W.	$\frac{1}{2}$ $\frac{1}{2}$ F E

‘IDAL STREAMS in the IRISH CHANNEL.

eam.					Remarks on the Tides near the Land.	Position.
½ over.	5 Miles.		From			
N. ¼	Rate. 2 ½	N.E. ¾ E.	Rate. 3 ½ to 4	St. Davids Head.	The stream curves with the land, and the flood sets sharply into Cardi- gan Bay, sweeping more and more in as you near the land. There is consequently an in-draught into this bay on both ebb and flood.	On a line join- ing St. Davids Head and the Tuskar.
¼ W.	2 ½	S.W. ¾ W.	4			
N. by N. ¼ S.	3 ½ 3	N.N.E. ¼ E. S.S.W. ¼ W.	3 2 ½	Bardsey Island.	The stream curves sharply round Bardsey, and slacks 1h. 20m. in the Bardsey Sound before it does in the offing; the flood setting strong into Caernar- von, and the ebb strong into Cardigan Bay, and <i>vice versâ</i> .	On a line join- ing Bardsey Island and the Arklow Light Ship.
E. ¾ E. ¼ W.	2 ½ 2 ½	N. by E. ¼ E. S.W. ¼ S.	3 ½ 3	Holyhead -	In passing Caernarvon Bay the stream curves with the bay more and more as you near the bight, setting into the bay on one side and out at the other end, near Holyhead Bay; the stream sets directly for the Skerries, sweeping into Holyhead Bay when inside a line, joining the North Stack and Skerries, and in the centre of the bay splits, one part setting sharply over the Platters and round Carmel Head, the other running for the Fenwick Rock and Penryn.	On a line join- ing Holyhead and Kish Light Ship.

quarter ebb and flood, at first close in with the shore, and gradually increases
rength, extending to seaward in a direction between N. W. and W. S. W. from
ighthouse, according to time of tide; about the last quarter tide it begins to
ide. With strong winds blowing against the tide, the race is heavy, especially
t half tide, and even dangerous at that time to small deep laden vessels, so
they should either go outside altogether or pass between it and the Stack
e to the latter). North and N.W. winds occasion the heaviest seas; at a
nce of 2 miles from the Stack the race is no longer felt, and by keeping the
ries to the eastward of N.E. by E. ½ E. a vessel will pass outside of it. Off
North Stack also there is a race after half tide, and although not dangerous at
time, it had better be kept clear of in heavy weather, as the seas break
t.

eam.				Remarks on the Tides near the Land.	Position.	
½ over.	5 Miles.		From			
East by S.	Rate. 2 1½	E. ½ N. W. ¾ S.	Rate. 3 3	Skerry Lighthouse.	From the Skerries the stream sweeps over the Coal Rock, and runs on thence to Lynus and Liverpool in nearly a direct line; but at 10 miles off shore it takes a more northerly direction, and strikes off for the Ribble and Morecambe Bay; near Lynus it curves to the southward, and runs for Priestholm and Great Orme Head; at half tide the stream slacks in Red Bay, and turns to the northward, and off Lynus meets the true tide, and forms a race.	On a line join- ing the Sker- ries and the Calf of Man.
¾ N. by S.	1½ 1½	S.E. by E. N.N.W. ¼ W.	2 1½	Calf of Man	Near the Calf, and to the northward, the flood sets to the southward, and the ebb to the northward; between the Calf and Rockabill the stream is very slack, being scarcely perceptible midway.	On a line join- ing the Calf of Man and Rockabill.

TABLE showing the DIRECTION and RATE (at SPRINGS)

Position.	Remarks on the Tides near the Land.	Magnetic Direction				
		From	5 Miles.	$\frac{1}{2}$ over.		
On a line joining Calf of Man and Walney Island.	Near the Calf, and eastward to Langness Point, the stream runs strong, and near the land bends to the northward, and passes Douglass Head on to Manghold Head, where it is turned to the East and S.E. by the northern stream.	Calf of Man	E. $\frac{1}{2}$ N. W. $\frac{1}{2}$ N.	Rate. $3\frac{1}{2}$ $3\frac{1}{2}$	East West	Rate. 2 2 F E
On a line joining St. Johns Point and Peel (Isle of Man).	The streams from the north and south channels meet off St. Johns Point. Near the land the stream runs a knot at springs, but at a distance there is scarcely any tide. Off the mouth of Lough Strangford, on a south bearing, the outset will be felt at a distance of $3\frac{1}{2}$ miles, sweeping in a curve to the N.E. with the ebb, and to the S.W. with the first of the flood, forming a race: the outset continues to run 2 hours after low water.	St. Johns Point.	S.W. by W. $\frac{1}{2}$ W. N.E. by E.	$1\frac{1}{2}$ $1\frac{1}{2}$	S.W. $\frac{1}{2}$ W. N.E. $\frac{1}{2}$ N.	$0\frac{1}{2}$ Draught F E
On a line joining Peel and Mull of Gallo-way.	- - -	Peel	E. $\frac{1}{2}$ N. W. $\frac{1}{2}$ N.	1 $1\frac{1}{2}$	E. by S. W.N.W. $\frac{1}{2}$ W.	$1\frac{1}{2}$ $1\frac{1}{2}$ F E

Position.	Remarks on the Tides near the Land.	Magnetic Direction				
		From	5 Miles.	$\frac{1}{2}$ over.		
On a line joining the Point of Ayr and Burrow Head.	Near the Point of Ayr, in a N.N.W. direction, there is usually a race, especially on the ebb: it takes place upon a bank, which, although shallower than the parts about it, is not dangerous.	Point of Ayr	S.E. by E. $\frac{1}{2}$ E. W. by N.	Rate. $3\frac{1}{2}$ 3	E. $\frac{1}{2}$ S. W. by N.	Rate. $2\frac{1}{2}$ $3\frac{1}{2}$ F E
On a line joining the Point of Ayr and St. Bees Head.	- - -	Point of Ayr	S. $\frac{1}{2}$ E. N.N.W.	$2\frac{1}{2}$ $1\frac{1}{2}$	S. $\frac{1}{2}$ E. N.W. by N.	$2\frac{1}{2}$ 1 F E

On the line joining Point of Ayr and St. Bees Head are situated the White-stone and King William Banks, which are very dangerous. The tide sets immediately over them, S. by E. $\frac{1}{2}$ E., at a rapid rate, and ought to be carefully guarded against.

The stream sets round the Point of Ayr into Ramsey Bay about the time of low water at Liverpool, and sweeps over the Bahama Bank, and from thence

Position.	Remarks on the Tides near the Land.	Magnetic Direction				
		From	5 Miles.	$\frac{1}{2}$ over.		
On a line joining Copeland Island and Mull of Gal-loway.	- - -	Copeland Island.	S. $\frac{1}{2}$ E. N. $\frac{1}{2}$ W.	Rate. 2 2	S. by E. $\frac{1}{2}$ E. N. by W. $\frac{1}{2}$ W.	Rate. 2 $2\frac{1}{2}$ F E

Magnetic Direction and Rate of the

After High Water at Liverpool.

1 Hour.		2 Hours.		3 Hours.		4 Hours.		5 Hours.		6 Hours.	
Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
N. $\frac{1}{2}$ E.		North		N. by W. $\frac{1}{2}$ W.		N.N.W. $\frac{1}{2}$ W.		N.W. $\frac{1}{2}$ N.		S.W. $\frac{1}{2}$ W.	

TIDAL STREAMS in the IRISH CHANNEL—continued.

3rd quarter of the flood having turned to the northward, meets the tide in the Sound off the Deputy Reef, and they jointly strike off for the south between the Copeland Islands and pass over the Bushes, and thence through the channel between the Islands.

An eddy under Mew Island at this time rushes with great speed to the northward until it meets the true tide, and with it forms a race which sailing-vessels should avoid; upon the ebb a similar race occurs, but to the N.E. of Mew Island.

The last of the flood goes to the northward through the Sound, and splits off at the end of the Copeland, and one part runs for Mew Island, throwing off an eddy between the islands.

About the Copeland Islands the eddies are very strong, and at night a vessel should be sure that she is outside the drift of the point of Mew Island.

From.		Remarks on the Tides near the Land.	Position.	
5 Miles.	From			
S.E. by W.	Rate. 2 1 1/4	Sanda Island	The tide runs fast past Sanda Island, and is variable in its direction. Off the western end of the island it splits; the outer part passing on for the Clyde, and the other going inside the island, and up Kilbrennen Sound, as mentioned below.	On a line joining Sanda Island and Corsewall Point.
1/2 E. 3/4 W.	1 1/4 1 1/2	Corsewall Point.	- - - - -	On a line joining Corsewall Point and Muck Island.

On passing Whitehead, the tide slacks considerably as you enter the Lough. At the flood there is a strong eddy under Muck Island, which will be found dangerous to steamers and even sailing-vessels beating along this coast; with a strong wind they will do well to keep close in with the shore hereabout, as the last of the flood strikes off from Muck Island in a S. E. direction, till it meets the ebb which passes the eastern side of the Maidens, when it takes a channel of its own; the meeting of these two tides appear to have occasioned a deep ditch, which will be found from 90 to 100 fathoms water.

Remarks on the Tides near the Land.	Position.
At the Mull of Cantyre the stream runs 5 knots, and occasions a heavy dangerous sea in bad weather; with either tide, quite close in, there is an eddy. At the Mull of Cantyre the flood takes a direction nearly for Sanda Island, and divides off its western end: one part passing inside the island and up Kilbrennen Sound, the other running on for the Clyde.	On a line joining Mull of Cantyre and Tor Point.

THE TIDES NEAR RATHLIN ISLAND.

BY RICHARD HOSKYN, STAFF COMMANDER R.N.,

In charge of the Survey on the North-east Coast of Ireland.

Rate of tide.

ABOUT Rathlin Island the tides are very rapid, in the Sound they run from 4 knots at neaps to $6\frac{1}{4}$ knots at springs, occasioning strong eddies along the shores, with heavy overfalls off all the headlands.

Eddy from Tor Point through the Sound.

On each side of Tor Point there is an eddy which at half tide gradually extends from the shore, at the last quarter of the Channel flood this eddy goes to the westward through Rathlin Sound, causing the ebb stream to make there $1\frac{1}{2}$ hours sooner than it does to the northward of the island; by taking advantage of these eddies a ship from the southward may carry 9 hours tide with her through Rathlin Sound.

Eddy on south shore.

To the westward of Fair Head all along the south shore of the Sound as far as Sheep Island there is an eddy with both streams, commencing at half tide. Carrickvaan Rock lies at the junction of the eddy and true streams.

Ebb stream.

During the first hour and half, the ebb stream sets round the Rue Point into Church Bay, but after high water at Liverpool, when the general stream north of the island has made to the westward, and it has attained a rate of $6\frac{1}{4}$ knots through the Sound, an eddy begins in Church Bay, setting from the Bull Point towards the Rue, and meeting the true tide about a mile to the westward of the latter, where the bottom is very irregular, a great overfall is occasioned, called Slough-na-more, which may be attended with danger to small vessels.

*Eddy in Church Bay.**Dangerous overfall.**Direction of ebb.*

The eddy from Church Bay has now forced the main stream into a more southerly course, with contracted limits it sets from Rue Point towards the Carrickvaan Rock, whence it shoots off in a N.W. direction towards the Bull Point at the west end of Rathlin, meeting there the stream from the north side of the island setting to the S.W.

Flood stream.

The flood or eastern stream does not begin in the middle of the Sound until it is low water at Liverpool, although, as before observed, the eddy along the south shore commences at half tide. There is no slack water preceding the flood stream; in the eastern part of the Sound at low water it sets south $2\frac{1}{2}$ knots, in the western part at the same moment it sets north $1\frac{3}{4}$ knots, eddying round at each station in opposite directions. The stream soon becomes general, setting fair through the Sound, and rushing out of Church Bay past the Rue with great force, including the eddy before alluded to, it sets for 10 hours across Church Bay to the eastward. During the flood stream there is an eddy to the eastward of the island, extending $2\frac{1}{2}$ miles from the shore, setting back on the island; at the junction of the eddy and true streams there are great overfalls off Altacarry Head, and again off the Rue as mentioned above.

*Eddy to eastward of Island.**Navigation of Sound.*

With a commanding breeze there is no danger in the navigation of Rathlin Sound, but in light winds great vigilance is necessary to avoid being caught in the eddies or overfalls.

Streams off Bengore Head.

Off Bengore Head, at a mile distant, the stream turns about 15 minutes after high and low water at Liverpool; springs run 3 knots, the ebb setting W.N.W. and the flood E. b. S. In the bays on each side of the heads an eddy begins when the stream in the offing has run half its course.

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Rate of tide.

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On each side of Tor Point there is an eddy which at half tide gradually extends from the shore, at the last quarter of the Channel flood this eddy goes to the westward through Rathlin Sound, causing the ebb stream to make there $1\frac{1}{2}$ hours sooner than it does to the northward of the island; by taking advantage of these eddies a ship from the southward may carry 9 hours tide with her through Rathlin Sound.

Eddy on south shore.

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Dangerous overfall.

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Off Bengore Head, at a mile distant, the stream turns about 15 minutes after high and low water at Liverpool; springs run 3 knots, the ebb setting W.N.W. and the flood E. b. S. In the bays on each side of the heads an eddy begins when the stream in the offing has run half its course.

erry Islets the *ebb stream* sets fair through the anchorage to the westward, attaining a velocity of 3 to $3\frac{1}{2}$ knots in between Ramore Head and the Carr Rocks, and creating a rough sea.

Streams near the Skerry Islet.

stream sets from Ramore Head towards the Carr Rocks ; and is entered it sets fair through.

Sound it sets down on the Little Skerry, while the ebb e northward through the Sound.

anchorage under the Great Skerry there is little tide felt, it is slack water at half tide, on the ebb with the last e on the north side of the rocks the stream runs with a knots.

ceed to the westward towards Lough Foyle the tide loses strength, north of the mouth of the Bann, 3 miles off shore rate at springs is $1\frac{3}{4}$ knots.

To the westward.

an eddy tide all the way along the shore from the Skerry mouth of the Bann, commencing at half tide, the line of with the main stream being marked by a strong rippling.

Eddy.

s north of Port Stewart the channel stream turns to the our and 40 minutes after low water at Liverpool, or at on the adjoining shore, and to the westward 31 minutes ater at Liverpool, or three quarters of an hour before low adjoining shore, so that, on this part of the coast, the tide reference to its head at Liverpool) being nearly reversed, what to a person watching the rise and fall of the tide appears at first sight so anomalous) the whole of the ebb ng from the ocean, while the flood comes from the opposite

Off Port Stewart.

High and low water not occasioned by tidal stream,

the tidal stream to the head of the tide at Liverpool, and times of high water to the undulation of the tide wave, t anomaly disappears.

but by tidal wave.

oast to the westward of Fair Head is subject to a ground e weather the commencement of the east-going stream is ent by the sudden appearance of the swell, resuming again e state of quiet when the west-going stream makes.

Ground swell.

SECTION II.

THE TIDAL STREAMS OF THE ENGLISH CHANNEL, WITH
SHOWING THEIR COURSE AND RATE AT EVERY HOUR OF THE
AT DOVER.

*Streams turn
with the tides of
Dover.*

IN the English Channel, as before stated (page 120), the time of water *at Dover* is to be taken as the standard, so that whenever the time of the turn or the direction of the stream is required known, the time of the ship is to be compared with the time of water for the day at the standard place, and the interval sought table which accompanies these remarks, and in the column answering the ship's position will be found the information required.*

*Tidal Compart-
ments.*

In these tables it has been necessary to class the information under heads answering to the various compartments of the Channel, the courses of the stream in the mixed tides are so changeable that a different stream will be found running at a place but little removed from another in the same portion of the Channel. The seaman must therefore look in which compartment according to his latitude and longitude his ship is sailing, and in which quarter of that compartment, whether N.E., N.W., S.E., or S.W., and then enter the table for the direction of the stream.

*1st Compart-
ment.*

The 1st compartment, as previously stated (page 120), comprises the approach to the English Channel *westward of a line joining the Lizard and Scilly.*

*2d Compart-
ment.*

The 2d compartment comprises a space eastward of the line mentioned from Ushant to Scilly, and as far as a line joining the *Start and the Casquets.* In this part of the Channel there is a tide, partaking of the joint directions of the Channel and streams.

*3d Compart-
ment.*

The 3d compartment is bounded on the west by the line joining the *Casquets and the Start*, and on the east by a line from *Beachy Head to Dieppe*, having the Baie de la Seine on the south. As soon as a vessel passes to the eastward of the Start and Casquets she gets the true Channel stream which sets straight up and down Channel the fairway, and will always carry a vessel *towards Beachy Head* when the water is *rising at Dover*, and *from it* while it is *falling there.*

*4th Compart-
ment.*

The 4th compartment comprises the Gulf of St. Malo, and the bay which from its magnitude and large tides exercises a powerful influence over the navigation of that part of the Channel in its immediate vicinity and the seaman must be especially on his guard when drawing near this locality. With the *falling water* at Dover the stream sets *into this Gulf* on both sides,† which the prevalence of westerly winds is said to increase, and with the *rising water* at Dover it sets *across out of* the Gulf, the north-eastern part of the stream sweeping round the *Casquets* towards Alderney, and through the Russel and other Channels about Guernsey towards the race of Alderney.

*5th Compart-
ment.*

The 5th compartment contains the great bight on the south side of the Channel eastward of Cape Barfleur, known as the Baie de la Seine. With the *rising water* at Dover the stream sets sharply round Cape Barfleur *into the bay*, curving more and more as the depth of the bay is gained until it finally takes the sweep of the shore. With the *falling tide* the western half of the bay is partly in eddy, and the tide runs in all that part nearly an hour before high water at Dover, while in the eastern half of the bay it runs about half an hour longer than at

* The time at ship is to be corrected for the longitude of Dover.

† A return of the vessels wrecked on the Channel Islands shows that the greater part of them came ashore about the end of the falling water at Dover.

that here a ship beating up Channel towards the end of a rising tide Dover may prolong the tide in her favour by standing close over the French Coast eastward of Havre. On approaching Boulogne, however, at the beginning of a *rising tide*, great attention should be paid to the direction in the tables, as the streams hereabout meet and are turned down upon the French Coast, so that a ship, which on the English side would at this time have a stream setting straight up Channel, here encounters one upon her beam, sweeping her down towards the Somme, and hence probably the cause of some of the many disastrous losses which have occurred in this part of the Channel.

6th Compartment.

The 6th compartment is between Beachy Head and the North Foreland, and the Somme and Dunkerque. In this space the streams from the Channel and North Sea *meet* while the water is *rising* at Dover, and *separate* while it is *falling* there. The point of union and separation is not, however, stationary, but moves from west to east both on the rising and falling water. For instance, an hour after high water at Dover the separation begins off Beachy Head; in two hours it has reached Hastings, in three hours Rye, and so it creeps on until at low water it has gained the line extending from the North Foreland to Dunkerque. At this time the offing streams on both sides have done, and it is slack water all over the North Sea and English Channel as far as the true tide extends; but the stream does not at this time cease in the intermediate tide. When the water at Dover begins to rise, the stream on either side sets *towards Dover*, and that from the North Sea consequently *goes with the intermediate* tide, which had not yet ceased running to the westward, while the other, the Channel stream, *opposes* it, and this opposition continues throughout the rising tide at Dover; the point of meeting gradually shifting its position eastward as the tide advances on the shore.* About the time when the water at Dover has done rising, the line of meeting has reached the North Foreland, and the streams are now slack over the Channels east and west, leaving the intermediate stream running alone before to the eastward. The next hour finds the offing streams made own east and west, so that now the intermediate stream falls in with the North Sea stream and goes with it, whilst on the west it separates from the Channel stream, splitting at the same point, Beachy Head, as first.

Such is the general description of the course and routine of the tidal streams of the English Channel and intermediate tide, a careful perusal which will enable the reader the more readily to understand the actions and tables annexed.

The place of *meeting* begins off Beachy Head at *five hours before* high water on the spot as that of the *separation* at *one hour after* high water; the place of *four hours before* high water is nearly the same as that of the separation at *two hours after*; and is nearly with the subsequent hours.

TABLE showing the MAGNETIC DIRECTION of the STREAM in the ENGLISH CHANNEL at every Hour of the Tide at DOVER.

COMPARTMENT I.

Westward of a Line joining Ushant and the Land's End.

Hours.	North Side of Latitude 49°00 N.						REMARKS.	South Side of 49°00 N.	
	West part.	Rate.	Near Scilly.	Rate.	Seven Stones.	Rate.		West part.	Rate.
After High Water, Dover.	1 W.N.W. ¼ W	Greatest rate, springs, 1°50 knots.	N.N.W. ½ W.	Greatest rate, springs, 1°50 knots.	N. ¼ W.	Greatest rate, springs, 1°60 knots.		W. ½ S.	Greatest rate, springs, 1°50 knots.
	2 N. ½ W.		N. ½ W.		N.N.E.			N. by W. ¼ W.	
	3 N.E. ¼ E.		N.N.E.		N.E. ¼ N.			E.N.E. ¼ E.	
	4 E.N.E. ¼ E.		N.N.E.		N.E. ½ E.			E.N.E. ¼ E.	
	5 E.N.E. ¼ E.		N.E. by E.		N.E. ¼ E.			N.E. by E. ¼ E.	
	6 E. ¼ S.		E. ¼ S.		E.N.E. ¼ E.			Turning.	
Before High Water, Dover.	5 S.E. by E. ½ E.	Greatest rate, springs, 1°50 knots.	- - -	Greatest rate, springs, 1°50 knots.	S. ¼ W.	Greatest rate, springs, 1°60 knots.		S. by E. ¼ E.	Greatest rate, springs, 1°50 knots.
	4 S. ½ E.		South.		S.S.W. ¼ W.			Draining.	
	3 S.S.W. ¼ W.		S.W.		S.S.W. ½ W.			S.W. ¼ W.	
	2 S.W. by W.		S.W. by W.		S.W. ½ S.			S.W. ¼ S.	
	1 W.S.W. ¼ W.		S.W. by W.		W.S.W.			S.W. by W. ¼ W.	

COMPARTMENT II.

Between { A Line joining the Land's End and Ushant,
" " the Casquets and Start, and
" " the Casquets and Sept Iles.

Hours.	North Side of the Channel.						REMARKS.	South Side of the Channel.					
	West part.	Rate.	Centre.	Rate.	East part.	Rate.		West part.	Rate.	Centre.	Rate.	East part.	Rate.
After High Water, Dover.	1 W.N.W. ¼ W.	Greatest rate, springs, 2°00 knots.	W. ¼ N.	Greatest rate, springs, 1°50 knots.	W. ½ N.	Greatest rate, springs, 2°25 knots.	{ W. ½ S. near Hurd's Deep. }	W. ½ S.	Greatest rate, springs, 1°50 knots.	W. ¼ N.	Greatest rate, springs, 1°50 knots.	W. ¼ S.	Greatest rate, springs, 2°10 knots.
	2 Turning.		N.W. by W. ¼ W.		W. ¼ N.			Slack.		West.		W. by S.	
	3 N. ¼ E.		W. ¼ N.		West.			East.		Slack.		W.S.W.	
	4 E. ½ S.		Slack.		S. ½ W.			E. by N.		E.S.E. ¼ E.		S.E. by S.	
	5 East.		E. ½ S.		S.E. ½ S.			E.N.E. ¼ E.		E. ½ S.		S.E. by E. ¼ E.	
	6 E. by S.		E. ¼ S.		E.S.E. ¼ E.			E. ¼ N.		S.E. by E. ¼ E.		S.E. ¼ S.	
Before High Water, Dover.	5 E.S.E. ¼ E.	Greatest rate, springs, 2°00 knots.	E. by S.	Greatest rate, springs, 1°50 knots.	E. by S.	Greatest rate, springs, 2°25 knots.		E. ¼ S.	Greatest rate, springs, 1°50 knots.	E. by S.	Greatest rate, springs, 1°50 knots.	E.S.E. ¼ E.	Greatest rate, springs, 2°10 knots.
	4 Slack.		E.S.E. ¼ E.		E. ¼ S.			N.E. by E. ¼ E.		Slack.		E. ¼ N.	
	3 Turning.		Slack.		E. ½ S.			Slack.		W.N.W.		North.	
	2 W. by N.		W. ¼ N.		Turning.			S.W. by W. ¼ W.		Slack.		W.N.W. ¼ W.	
	1 W. ¼ S.		W. ¼ N.		W.S.W. ¼ W.			S.W. by W.		W. by N.		N.W. ¼ W.	

COMPARTMENT III.

Between { A Line joining Start and Casquets, and
" " Point Ailly and Beachy Head.

Hours.	West part.	Rate.	Centre.	Rate.	East part.	Rate.	REMARKS.	Over Hurd's Deep.	Rate.	Off Cape Bardeur.	Rate.
After High Water, Dover.	1 W. ¼ N.	Greatest rate, flood 2°30 ebb 2°40 knots.	W.N.W. ¼ W.	Greatest rate, flood 3°06 ebb 3°33 knots.	Turning.	Greatest rate, flood 3°00 ebb 3°40 knots.		W. ¼ S.	Greatest rate, flood 2°15 ebb 2°40 knots.	N.W.	Greatest rate, flood 3°40 ebb 3°52 knots.
	2 W.N.W. ½ W.		N.W. by W. ¼ W.		W.N.W. ½ W.			W. ¼ S.		N.W.	
	3 W. ¼ N.		N.W. by W. ¼ W.		W.N.W. ¼ W.			W. ¼ S.		N.W.	
	4 W. ¼ S.		W.N.W.		W. ¼ N.			W.S.W.		N.W.	
	5 W. ¼ S.		W.N.W.		W. by N.			W.S.W. ¼ W.		N.W.	
	6 N.N.E. ¼ E.		W.N.W. ¼ W.		W. by N.			Slack.		N.W.	
Before High Water, Dover.	5 E. ¼ S.	Greatest rate, springs - - -	E.S.E.	Greatest rate, springs - - -	E.S.E. ¼ E.	Greatest rate, springs - - -		E. ¼ S.	Greatest rate, springs - - -	S.E.	Greatest rate, springs - - -
	4 E.S.E. ¼ E.		S.E. by E. ¼ E.		E.S.E. ¼ E.			E. ¼ S.		S.E.	
	3 E.S.E. ¼ E.		S.E. by E. ¼ E.		E.S.E. ¼ E.			E. ¼ S.		S.E.	
	2 E.S.E. ¼ E.		S.E. by E. ¼ E.		E.S.E. ¼ E.			E. ¼ N.		S.E.	
	1 E.S.E. ¼ E.		E.S.E.		E. ¼ S.			E.N.E.		S.E.	

COMPARTMENT IV.

f Gulf of St. Malo on a line joining Brehat Island and S.W. line of Guernsey Island.

s from Island.		12 miles from Guernsey Island.		REMARKS.	Near S.W. Point, Guernsey Island.		4 miles W. by S. from Casquets.		4 miles W.N.W. of Cape La Hague.	
	Rate.	Course.	Rate.		Course.	Rate.	Course.	Rate.	Course.	Rate.
W.	Greatest rate, springs, uncertain knots.	W. $\frac{3}{4}$ N.	Greatest rate, springs, uncertain knots.		W. $\frac{3}{4}$ N.	Greatest rate, springs, uncertain knots.	W. $\frac{3}{4}$ S.	Greatest rate, springs, knots.	S.W.by W. $\frac{3}{4}$ W.	Greatest rate, springs, 5 to 7 knots.
7.		S. $\frac{1}{4}$ W.		S.S.W. $\frac{1}{4}$ W.	S.W. $\frac{1}{4}$ W.		S.W.by W. $\frac{3}{4}$ W.			
7.		S. $\frac{3}{4}$ W.		S.S.W. $\frac{1}{4}$ W.	S.W. $\frac{1}{4}$ W.		S.W.by W. $\frac{3}{4}$ W.			
8.		S.S.E. $\frac{3}{4}$ E.		S.E. by E. $\frac{1}{2}$ E.	S. by E. $\frac{1}{4}$ E.		S.W. $\frac{1}{4}$ S.			
3.		S.E. $\frac{3}{4}$ E.		S.E. by E. $\frac{1}{2}$ E.	S.E. $\frac{1}{2}$ E.		S.W. $\frac{1}{4}$ S.			
8.		S.E. $\frac{1}{4}$ S.		S.E. by E. $\frac{1}{2}$ E.	S.E. $\frac{1}{2}$ E.		N.E. by E. $\frac{3}{4}$ E.			
E.		S.E. by E.		{ S.E. by E. $\frac{1}{2}$ E. E. $\frac{1}{4}$ N. S.E. by E. $\frac{1}{2}$ E. E. $\frac{1}{2}$ N. }	E. $\frac{3}{4}$ N.		N.E. by E. $\frac{3}{4}$ E.			
W.	Greatest rate, springs, uncertain knots.	..	Greatest rate, springs, uncertain knots.		..	Greatest rate, springs, uncertain knots.	N.E. $\frac{1}{2}$ N.	Greatest rate, springs, knots.	N.E. $\frac{1}{4}$ N.	Greatest rate, springs, 5 to 7 knots.
W.		N.W. $\frac{1}{2}$ N.		..	N.E. $\frac{1}{2}$ N.		N.E. $\frac{1}{4}$ N.			
W.		N.W. $\frac{1}{2}$ W.		N. by W. $\frac{3}{4}$ W.	N.E. by E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ N.			
W.		W.N.W. $\frac{1}{4}$ W.		N. by W. $\frac{3}{4}$ W.	N.W. $\frac{1}{2}$ W.		N.E. $\frac{1}{4}$ N.			

COMPARTMENT V.

the Baie de la Seine, south of a line joining Cape Barfleur and Cape Antifer.

West Part.	Rate.	Centre.	Rate.	East Part.	Rate.	REMARKS.
N.N.W. $\frac{3}{4}$ W.	Greatest rate, springs, 4'20" flood, 3'70" ebb.	N.W. by W. $\frac{3}{4}$ W.	Greatest rate, springs, 3'20" flood, 3'20" ebb.	W. $\frac{1}{2}$ N.	Greatest rate, springs, 3'30" flood, 3'00" ebb.	
N.N.W. $\frac{1}{2}$ W.		N.W. by W. $\frac{3}{4}$ W.		W. $\frac{3}{4}$ S.		
N.N. W.		N.W. by W. $\frac{3}{4}$ W.		W.N.W. $\frac{3}{4}$ W.		
N.N.W. $\frac{3}{4}$ W.		N.W. by W. $\frac{3}{4}$ W.		W. $\frac{1}{4}$ N.		
N. by W. $\frac{3}{4}$ W.		N.W. by W. $\frac{1}{4}$ W.		W. $\frac{1}{4}$ N.		
Slack.		N.W. by W. $\frac{1}{4}$ W.		W. $\frac{1}{4}$ S.		
S.S.E.		S.E. by E. $\frac{3}{4}$ E.		W. $\frac{1}{4}$ S.		
S.S.E.		S.E. by E. $\frac{3}{4}$ E.		E.N.E. $\frac{1}{4}$ E.		
S.S.E.		S.E. by E. $\frac{3}{4}$ E.		E.N.E. $\frac{1}{2}$ E.		
S.E. by S.		S.E. by E. $\frac{3}{4}$ E.		E.N.E. $\frac{1}{2}$ E.		
S.E. by S.		S.E. by E. $\frac{3}{4}$ E.		E.N.E. $\frac{1}{2}$ E.		

COMPARTMENT VI.

Between { A line joining Beachy Head and Point Ailly, and
the North Foreland and Dunkerque.

REMARKS.	West of	East of	Off Southsand Head.		Off Northsand Head.	
	Line of Separation.		Course.	Rate.	Course.	Rate.
des separate on a line joining— chy Head and St. Valery	W. by N.	N.E. by E. $\frac{1}{4}$ E.	N.E. $\frac{1}{4}$ E.	Greatest rate, springs, 3'3 knots.	N.N.E.	
ings and Treport	W. $\frac{1}{2}$ N.	N.E. by E. $\frac{1}{4}$ E.	N.E. $\frac{3}{4}$ E.		N.N.E.	
ings and Cayeux	W. $\frac{1}{4}$ N.	E.N.E.	N.E. by E. $\frac{1}{2}$ E.		N.E. $\frac{1}{4}$ E.	
stone and Calais	W. by S.	E.N.E.	N.E. by E. $\frac{3}{4}$ E.		E. by S.	
h Foreland and Point Gravelines . .	s.w. by w. $\frac{1}{4}$ w.	N.E. by E. $\frac{1}{2}$ E.				
sgate and Nieuport, passing over North nd Head, the South Line of the Falls, d the banks off Nieuport	W. by S.	{ E. $\frac{1}{4}$ N. and Northward. }	S.W. $\frac{1}{4}$ S.		S.S.W.	
des meet on a line joining— chy Head and Point Ailly	E.S.E.	s.w. by w. $\frac{1}{4}$ w.	S.W.		S.S.W.	
hill and Cayeux, both streams turning wn towards the "Somme"	S.S.E. $\frac{1}{2}$ E.	S. by W. $\frac{1}{4}$ W.	S.W. $\frac{3}{4}$ W.		S.S.W.	
les meet on a line joining Rye and the e, passing over the Bassurelle, both setting to the Somme	S.E. by E. $\frac{1}{4}$ E.	S.W. by W.	W.S.W. $\frac{1}{4}$ W.		S.S.W.	
des meet on a line joining— ngeness and Touquet Point	E. by N.	W.S.W. $\frac{1}{2}$ W.	W. $\frac{3}{4}$ N.		S.S.W.	
ver and Dunkerque nearly	N.E. by E. $\frac{1}{4}$ E.	W.S.W.	N.N.E.		S.S.W.	

SECTION III.

TIDAL STREAMS IN THE NORTH SEA.

*Streams turn
with the Tides
of Dover.*

IN the North Sea the general features of the streams correspond exactly with those of the English Channel, but the *direction* of the stream is reversed. As soon as the intermediate tide is passed, on coming from the westward, a ship enters the True Stream, which extends from the North Foreland to a line joining the Leman and Ower Light and the Texel. To the northward between the Ower and Texel a mixed tide occurs, similar to that which is experienced off the Start, occasioned by the channel stream encountering that of the Offing Stream; and beyond these limits the time of slack water varies with the advance of the tidal hour, as at the entrance of the English Channel; and with this peculiarity also, that in a very short distance there occurs a difference of three hours in the time of slack water.

*Direction of
True Stream.*

The True Stream will always carry a vessel *towards* the North Foreland while the water is *rising at Dover*, and *from it* while it is *falling at that place*.* This stream sets nearly N.E. and S.W., except near the coasts, where it partakes of the form of the land; and at the entrance of the Thames where it is diverted from its course by the river. The annexed table will show these deviations and the exact course of the stream in the channel, which, for the convenience of reference, is also divided into compartments.

*North Sea
divided into 15
Compartments.*

The 7th compartment comprises the entrance to the Thames; viz., at the Mouse, Sunk, Kentish Knock, and Galloper Light Vessels, and 5 miles north of the North Foreland.

The 8th compartment comprises a space between the mouth of the Thames and the coast of the Netherlands south of 52° N.

The 9th compartment comprises between 52° and 53° N. and the English coast as far as 2° E. and also the Shipwash, Stanford, Saint Nicholas Gat, Cockle, Newarp, and Hasborough Light Vessels.

The 10th compartment comprises between 52° and 53° N. and from 2° to 3° E.

The 11th compartment comprises between 52° and 53° N., and from 3° to 4° E.

The 12th compartment comprises between 52° and 53° N., and from 4° E. to the coast of the Netherlands.

The 13th compartment comprises between 53° and 54° N., and from 1° to 3° E., and the Leman and Ower Light Vessel.

The 14th compartment comprises between 53° and 54° N., and from 3° to 5° E.

The 15th compartment comprises between 53° and 54° N. and westward of 1° E., and the Spurn and Dudgeon Light Vessels.

The 16th compartment comprises from 1° to 8° E. on the parallel of 54° N.

The 17th compartment comprises from 0° to 8° E. on the parallel of 55° N.

The 18th compartment comprises from 1° to 8° E. on the parallel of 56° N.

The 19th compartment comprises from 2° W. to 8° E. on the parallel of 57° N.

The 20th compartment comprises from 3° W. to 3° E. on the parallel of 58° N.

The 21st compartment comprises from 2° W. to 0° on the parallel of 59° N.

* Upon the banks lying towards the coast of Holland, between the Texel and the Schelde, where there is scarcely any rise or fall of the water, the stream continues nearly 40 minutes longer than in other parts of the channel.

TABLE showing the MAGNETIC DIRECTION of the TIDAL STREAMS in the NORTH SEA from a line joining the SPURN POINT and HELGOLAND to the NORTH FORELAND at every hour of the tide at DOVER.

COMPARTMENT VII.
Entrance to the Thames.

Hours.	Mouse Light Ship.		Sunk Light Ship.		Kentish Knock Light Ship.		5 Miles north of North Foreland.		Gallopier Light Vessel.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 W. by N.	Greatest rate, springs, 2½ knots.	Slack.	Greatest rate, springs, 3½ knots.	N.E.	Greatest rate, springs, 2½ knots.	N.N.W. ½ W.	1'80	N.E. ½ E.	Greatest rate, springs, 2½ knots.
	2 Slack.		N.E. by E. ¾ E.		N.E.		N. ¼ E.	1'20	N.E. by E.	
	3 E. ¾ S.		E.N.E. ¾ E.		N.E.		N.E. ½ E.	1'18	N.E. by E.	
	4 E. ¾ S.		E.N.E. ¾ E.		N.E.		E.S.E. ¾ E.	1'46	N.E. ¾ E.	
	5 E. ¾ S.		E.N.E. ¾ E.		N.E.		E.S.E. ¾ E.	1'60	N.E. by E.	
	6 E. ½ S.		E.N.E. ¾ E.		N.E.		S.E. ¾ E.	1'45	N.E. by E.	
Before High Water, Dover.	5 E. ¾ S.	Greatest rate, springs, 2½ knots.	..	Greatest rate, springs, 3½ knots.	S.W. ¾ S.	Greatest rate, springs, 2½ knots.	S.S.E. ½ E.	1'30	S. ¾ W.	Greatest rate, springs, 2½ knots.
	4 Slack.		S.W. by W. ¾ W.		S.W. ¾ S.		S. ¾ W.	1'36	S.W. ¾ S.	
	3 W. ¾ S.		S.W. by W. ¾ W.		S.W. ¾ S.		S.W. ½ S.	1'60	S.W. by W.	
	2 W. ¾ S.		W.S.W. ¾ W.		S.W. ¾ S.		S.W. ½ W.	1'65	S.W. by W. ¾ W.	
	1 W. ¾ S.		W. ½ S.		S.W. ¾ S.		W.S.W.	1'40	W.S.W.	

COMPARTMENT VIII.

Between the mouth of the Thames and the coast of the Netherlands south of 52° N. latitude.

Hours.	West of 2° E.		Between 2° and 3° E.		East of 3° E.		REMARKS.
	Course.	Rate.	Course.	Rate.	Course.	Rate.	
After High Water, Dover.	1	N.E. ¾ E.	{flood 2½ to 3½ ebb 2½ to 3½}	E.N.E. ¾ E.	{flood 2½ to 3½ ebb 2½ to 3½}	N.E. by E. ¾ E.	Stream from the Schelde N.W. by W. to 3° E. turn- ing sharply to N.E. Stream from the Schelde N.W. by W. to 2½° E. turning sharply to N.N.E. ½ E.
	2	N.E. ½ E.		E.N.E.		N.E. by E.	
	3	N.E.		N.E.		N.E. ½ E.	
	4	N.E. by E. ¾ E.		N.E. ½ E.		N.E. ½ E.	
	5	N.E. ½ E.		N.E. ½ E.		N.E. ½ E.	
	6	N.E. ¾ E.		N.E.		N.N.E. ¾ E.	
Before High Water, Dover.	5	S.W. ¾ S.	Greatest rate, springs,	S.W. by W. ¾ W.	Greatest rate, springs,	W.S.W.	
	4	S.W.		S.W. ½ W.		S.W. ¾ W.	
	3	S.W.		S.W.		S.W. ¾ W.	
	2	S.W.		S.W.		S.W. ½ W.	
	1	S.W. ¾ S.		S.W.		S.W. ¾ W.	

COMPARTMENT IX.

Between the latitude 52° and 53° N. and the English Coast as far as 2° E. longitude.

Hours.			REMARKS.
After High Water, Dover.	1	Stream runs northward.	Taking the direction of the land, except close to the banks, for which special instructions are necessary.
	2		
	3		
	4		
	5		
	6		
Before High Water, Dover.	5	Stream runs southward.	
	4		
	3		
	2		
	1		

TIDAL STREAMS

COMPARTMENT IX.—continued.

		Shipwash Light Vessel.		Stanford Light Vessel.		St. Nicholas Gat Light Vessel.		Cockle Light Vessel.		Newarp Light Vessel.		Hasborough Light Vessel.	
Hours.		Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1	E.N.E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ N.		N. $\frac{1}{4}$ E.		N.N.E.		N. $\frac{1}{4}$ W.		N. by W. $\frac{1}{2}$ W.	
	2	E.N.E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ N.		N. $\frac{1}{4}$ E.		N.N.E.		N. $\frac{1}{4}$ W.		N. by W. $\frac{1}{4}$ W.	
	3	E.N.E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ N.		N. $\frac{1}{4}$ E.		N.N.E.		N. $\frac{1}{4}$ W.		N. by W. $\frac{1}{2}$ W.	
	4	E.N.E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ N.		N. $\frac{1}{2}$ W.		N.N.E.		N. $\frac{1}{4}$ W.		N. by W. $\frac{1}{2}$ W.	
	5	N.E. by E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ E.		N. $\frac{1}{4}$ W.		N.N.E.		N. $\frac{1}{4}$ W.		N. by W. $\frac{1}{2}$ W.	
	6	N.E.		Slack		N. by W.		S. $\frac{1}{4}$ W. on the turn.		N. $\frac{1}{4}$ E.		S. by E.	
Before Low Water, Dover.	5	S.W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S. $\frac{1}{4}$ E.		S. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ E.		S. by E. $\frac{1}{2}$ E.	
	4	S.W. by W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S. $\frac{1}{4}$ E.		S. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ E.		S. by E. $\frac{1}{2}$ E.	
	3	S.W. by W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S. $\frac{1}{2}$ W.		S. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ E.		S. by E. $\frac{1}{2}$ E.	
	2	S.W. by W. $\frac{1}{4}$ W.		S.W. by S.		S. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ E.		S.S.E.	
	1	S.W. by W. $\frac{1}{4}$ W.		S.S.W. $\frac{1}{4}$ W.		S. by W. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ E.		S. by E.	

COMPARTMENT X.

Between the latitude 52° and 53° N. and longitude 2° to 3° E.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
After High Water, Dover.									
1	N.E. $\frac{1}{2}$ N.		N.E.		N.E. $\frac{3}{4}$ N. *		N. by W.		
2	N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{2}$ N.		N.E. $\frac{3}{4}$ N.		N. $\frac{1}{2}$ E.		
3	N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ E.		N.N.E. $\frac{1}{4}$ E.		N.N.E. $\frac{1}{4}$ E.		
4	N.E.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ E.		N. $\frac{1}{4}$ W.		
5	N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N. $\frac{1}{2}$ W.		
6	N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. by N.		N.N.E. $\frac{1}{4}$ E.		
Before High Water, Dover.									
5	S.W. $\frac{1}{2}$ S.		S.W. $\frac{3}{4}$ W.		S. $\frac{1}{2}$ E.		S. $\frac{3}{4}$ W.		
4	S.W.		S.W. $\frac{3}{4}$ S.		South.		S. $\frac{3}{4}$ W.		
3	S.W. $\frac{1}{2}$ S.		S.W. $\frac{1}{4}$ S.		S. by W. $\frac{1}{4}$ W.		S. by W.		
2	S.W.		S.W. $\frac{1}{4}$ S.		S.S.W. $\frac{1}{4}$ W.		S.S.W.		
1	S.W. $\frac{1}{2}$ W.		S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		S. by W. $\frac{1}{4}$ W.		
		Greatest rate, springs, 2'25 knots.		Greatest rate, springs, 1'60 knots.		Greatest rate, springs, { flood 1'40 knots. ebb 1'40 }		Greatest rate, springs, { flood 2'60 knots. ebb 3'00 }	* Turning sharply off for the Leman and Ower.

COMPARTMENT XI.

Between the latitude 52° and 53° N. and longitude 3° to 4° E.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
After High Water, Dover.									
1	N.E.		Slack.		N.E. $\frac{1}{2}$ N.		N.E. $\frac{1}{2}$ N.		
2	N.E.		N.E.		N.E.		N.E. $\frac{1}{4}$ N.		
3	N.E.		N.E.		N.E.		N.E.		
4	N.E. $\frac{1}{2}$ N.		N.E.		N.E. $\frac{1}{4}$ E.		N.E.		
5	N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		
6	N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		
Before High Water, Dover.									
5	S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{2}$ S.		S. by E. $\frac{1}{2}$ E.		S.S.E. $\frac{1}{4}$ E.		
4	S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		S.S.W.		South.		
3	S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{2}$ W.		S.W. $\frac{1}{2}$ S.		S.W. $\frac{1}{2}$ S.		
2	S.W. $\frac{1}{2}$ S.		S.W. $\frac{3}{4}$ W.		S.W. $\frac{1}{2}$ S.		S.W. $\frac{1}{2}$ S.		
1	S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{2}$ S.		

COMPARTMENT XII.

Between the latitude 52° and 53° N. and from longitude 4° E. to the Coast of the Netherlands.

Hours.		REMARKS.
After High Water, Dover.	Stream runs northward.	The stream takes the direction of the land, except close to the banks, for which special instructions are necessary.
Before High Water, Dover.	Stream runs southward.	

COMPARTMENT XIII.

Between the latitude 53° and 54° N. and from longitude 1° to 3° E.

	S. W. Quarter.	Rate.	S. E. Quarter.	Rate.	N. E. Quarter.	N. W. Quarter.	Leman and Ower Light Vessel.		REMARKS.
							Course.	Rate.	
1	N. N. W. ¼ W.	flood 2'25 } knots. ebb 2'25 }	N. by W. ½ W.	flood 2'00 } knots. ebb 2'30 }	N. N. W. ¼ W.	N. ½ W.	N. by W. ¾ W.	Greatest rate, springs, 2'0 knots.	Near the north point of Smith's Knoll the rates are, flood 2'6, ebb 3'0 knots.
2	N. W. ½ N.		N. by W. ¼ W.		North.	N. ¾ W.	N. by W. ¾ W.		
3	N. N. W. ½ W.		N. ¼ E.		N. by E.	N. by W. ½ W.	N. N. W.		
4	N. N. W. ¼ W.		N. ¼ E.		N. N. E.	N. W. ½ W.	N. N. W.		
5	N. N. W. ¾ W.		N. ¼ E.		E. N. E.	S. by W. ¼ W.	N. N. W.		
6	- - -	Greatest rate, springs, 2'0 knots.	N. N. E. ¼ E.	Greatest rate, springs, 2'0 knots.	S. E.	S. ¼ E.	Slack.		
5	S. S. E. ¾ E.		S. S. E. ¾ E.		S. E. ½ S.	S. ½ E.	S. S. E.		
4	S. S. E. ¾ E.		S. S. E. ¾ E.		S. ¾ E.	S. by E. ¼ E.	S. S. E.		
3	S. S. E. ½ E.		S. by E.		South.	S. S. E. ¼ E.	S. S. E.		
2	S. by E.		S. ¼ E.		S. ¾ W.	E. S. E. ½ E.	S. S. E.		
1	S. S. E. ¼ E.		S. by W.		South.	N. E. by N.	S. S. E.		

COMPARTMENT XIV.

Between the latitude 53° and 54° N. and 3° to 5° E. longitude.

S. W. Quarter.	Rate.	S. E. Quarter.	Rate.	N. E. Quarter.	Rate.	N. W. Quarter.	Rate.	REMARKS.
W. N. W. ¼ W.	flood 1'20 } knots. ebb 1'50 }	W. S. W. ½ W.	flood 1'35 } knots. ebb 3'00 }	W. ¾ S.	flood 0'80 } knots. ebb 1'00 }	S. W. by W.	flood 0'90 } knots. ebb 1'00 }	In the north-eastern quarter of this compartment the Helgo-land stream joins the Channel stream on the falling water at Dover, and the streams split on the rising water at Dover, and a vessel to the northward of 53'30 on the rising tide will be set down towards Helgoland.
N. N. W. ½ W.		W. S. W. ¼ W.		West.		N. W. by W. ½ W.		
N. by W. ¾ W.		W. ¾ S.		West.		N. W. ½ N.		
N. by E. ¾ E.		N. N. W.		N. N. W. ½ W.		N. by W. ½ W.		
N. E. ½ N.		N. E. ¼ N.		N. E. ½ N.		N. E. by N.		
N. N. E. ¾ E.		N. E. by E. ¼ E.		E. ¾ N.		E. by N.		
E. ¼ S.		E. N. E. ¼ E.		E. by S.		S. E. by E.		
S. E. ½ S.		E. N. E. ¼ E.		E. S. E. ¾ E.		S. E. ½ E.		
S. by E.		S. S. W. ¼ W.		S. E. ¾ E.		South.		
S. by W. ¼ W.		S. W. by S.		S. E. ¼ S.		S. W. ¾ S.		
S. W. ½ S.		S. W. ¼ S.		S. ¾ E.		S. W. ½ S.		Splitting on Texel Island.

COMPARTMENT XV.

Between the latitude 53° and 54° N. and westward of longitude 1° E.

Hours.	Course.	Rate.	Spurn Light Vessel.		Dudgeon Light Vessel.	
			Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. $\frac{1}{2}$ E.	Greatest rate, } flood $2\frac{1}{2}$ knots. } ebb $3\frac{1}{4}$ knots.	E.N.E.	Greatest rate, springs, $3\frac{1}{2}$ knots.	N. by W. $\frac{1}{2}$ W.	Greatest rate, springs, $2\frac{1}{2}$ knots.
	2 N.N.W. $\frac{1}{4}$ W.		S.W. by S.		N.N.W.	
	3 -		S.W. $\frac{1}{2}$ S.		N.W. $\frac{1}{4}$ N.	
	4 S.W.		S.W.		W. $\frac{1}{4}$ S.	
	5 S.W. $\frac{1}{2}$ W.		S.W.		S.W. $\frac{1}{4}$ S.	
	6 S.W. $\frac{1}{4}$ S.		S.W.		S. $\frac{1}{4}$ E.	
Before High Water, Dover.	5 S. $\frac{1}{2}$ E.		S.W.		S. by E. $\frac{1}{4}$ E.	
	4 S. by E. $\frac{1}{4}$ E.		N.E. by E.		S.S.E.	
	3 S.S.W. $\frac{1}{4}$ W.		N.E. by E. $\frac{1}{2}$ E.		S.E.	
	2 N. by E. $\frac{1}{4}$ E.		E.N.E.		E. $\frac{1}{2}$ S.	
	1 N.N.E. $\frac{1}{4}$ E.		E.N.E.		N.E. $\frac{1}{2}$ N.	

COMPARTMENT XVI.

On the parallel of 54° N.

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. by W. $\frac{1}{2}$ W.		N.N.W. $\frac{1}{2}$ W.		N.W. $\frac{1}{4}$ W.		N.W. by W. $\frac{1}{4}$ W.	
	2 N. by W. $\frac{1}{2}$ W.		N.W. $\frac{1}{4}$ N.		N.W. by W. $\frac{1}{4}$ W.		W.N.W. $\frac{1}{4}$ W.	
	3 N.W. by N.		N.W. $\frac{1}{4}$ W.		N.W. by W. $\frac{1}{4}$ W.		W. by N.	
	4 S. $\frac{1}{2}$ E.		W.N.W. $\frac{1}{2}$ W.		N.W. $\frac{1}{4}$ N.		N. $\frac{1}{4}$ W.	
	5 S. $\frac{1}{2}$ E.		W. $\frac{1}{2}$ S.		N. by W.		N.E. $\frac{1}{2}$ N.	
	6 S.S.E.		S. by E.		E. by N.		E. by N.	
Before High Water, Dover.	5 S.E. $\frac{1}{2}$ S.		S.E. $\frac{1}{4}$ S.		E.S.E. $\frac{1}{4}$ E.		E. $\frac{1}{4}$ N.	
	4 S.E. by E.		S.E. $\frac{1}{4}$ E.		E.S.E. $\frac{1}{4}$ E.		E. $\frac{1}{2}$ S.	
	3 E. $\frac{1}{4}$ S.		S.E. $\frac{1}{2}$ E.		E.S.E. $\frac{1}{4}$ E.		E. by S.	
	2 N.E. $\frac{1}{4}$ N.		S.E. by E. $\frac{1}{4}$ E.		E.S.E.		S.E.	
	1 N. by E. $\frac{1}{4}$ E.		E.N.E. $\frac{1}{2}$ E.		S. $\frac{1}{4}$ W.		S. by E. $\frac{1}{2}$ E.	

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N.W. by W. $\frac{1}{4}$ W.	Greatest rate, 1 knot.	W. by N.	Greatest rate, 1 knot.	West		E.N.E. $\frac{1}{4}$ E.	Greatest rate, 1 knot.
	2 N.W. by W.		W.N.W.		W.N.W.		N.E. $\frac{1}{2}$ E.	
	3 W.N.W.		W.N.W.		W.N.W.		N.W.	
	4 W.N.W.		W. by N.		W.N.W.		W.N.W.	
	5 W.N.W.		W.N.W.		W.N.W.		N.W. by W.	
	6 W.N.W.		W.N.W.		W.N.W. $\frac{1}{2}$ W.		W. $\frac{1}{2}$ S.	
Before High Water, Dover.	5 E.S.E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		S.S.E. $\frac{1}{2}$ E.		W. by S.	
	4 S.E. by E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		S.S.W. $\frac{1}{4}$ W.	
	3 S.E. $\frac{1}{2}$ E.		E.S.E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		S. $\frac{1}{4}$ E.	
	2 S.E. $\frac{1}{2}$ E.		E.S.E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		S.E. by E.	
	1 S.E. by E. $\frac{1}{2}$ E.		E.S.E. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		E.N.E. $\frac{1}{4}$ E.	

About the meridian of 8° E. the influence of the Elbe and Weser causes the stream to run nearly two hours to the north-eastward on the falling tide after it has turned westward in other parts, and on the rising tide to run two hours to the westward after the stream has turned eastward in a more westerly meridian.

On the parallel of 55° N.

On the parallel of 56° N.

Hours.		1° E.		2° E.		3° E.		4° E.	
		Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1	N.N.E. $\frac{1}{4}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	Slack.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N.W. $\frac{1}{4}$ W.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N. $\frac{1}{4}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.
	2	Slack.		S.W. $\frac{1}{2}$ W.		W.N.W.		N.N.W. $\frac{1}{4}$ W.	
	3	S. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ W.		N.W. $\frac{1}{4}$ N.		N.W. $\frac{1}{4}$ W.	
	4	S. $\frac{1}{4}$ E.		W. by S.		N.W.		N.E. $\frac{1}{4}$ E.	
	5	S. $\frac{1}{4}$ E.		S. $\frac{1}{4}$ E.		N. by W. $\frac{1}{4}$ W.		N.E. by E. $\frac{1}{4}$ E.	
	6	S. $\frac{1}{2}$ E.		S. $\frac{1}{4}$ E.		N. $\frac{1}{4}$ W.		E. $\frac{1}{4}$ S.	
Before High Water, Dover.	1	S.E. by E. $\frac{1}{4}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	E. by S.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N. by E. $\frac{1}{4}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	E. $\frac{1}{4}$ N.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.
	2	N.E. by E. $\frac{1}{4}$ E.		E.N.E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ E.		E. $\frac{1}{4}$ N.	
	3	N.E. $\frac{1}{4}$ N.		E.N.E.		East.		N.E. by E. $\frac{1}{4}$ E.	
	4	N.E. by N.		N.E. by E. $\frac{1}{4}$ E.		N.E. by E.		E.N.E. $\frac{1}{4}$ E.	
	5	N.E. $\frac{1}{4}$ E.		N.E. by E.		North.		N.E. by E. $\frac{1}{4}$ E.	
	6	N.E. $\frac{1}{2}$ E.							

COMPARTMENT XVIII—continued.

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 Turning.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	Slack.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	E.N.E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N.E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.
	2 W. $\frac{1}{2}$ S.		N.N.W.		N.E. by N.		N. $\frac{1}{2}$ E.	
	3 N.W. $\frac{1}{2}$ N.		N.N.W.		N. $\frac{1}{2}$ E.		N. $\frac{1}{2}$ W.	
	4 N. by W. $\frac{1}{2}$ W.		N. by W. $\frac{1}{2}$ W.		N. $\frac{1}{2}$ W.		N. by W.	
	5 N.N.E. $\frac{1}{2}$ E.		N. $\frac{1}{2}$ W.		N. $\frac{1}{2}$ W.		N. by W.	
	6 N.E. $\frac{1}{2}$ E.		N.N.E.		N. by W.		N. by W.	
Before High Water, Dover.	5 E.N.E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N.E. by E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N. by W.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N.N.W. $\frac{1}{2}$ W.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.
	4 N.E. by E. $\frac{1}{2}$ E.		E.N.E. $\frac{1}{2}$ E.		N.E. $\frac{1}{2}$ E.		N. by E.	
	3 E.N.E. $\frac{1}{2}$ E.		E. $\frac{1}{2}$ N.		E. $\frac{1}{2}$ S.		S. by W.	
	2 East.		E. $\frac{1}{2}$ S.		E. $\frac{1}{2}$ S.		S.W.S.	
	1 E. $\frac{1}{2}$ N.		E. by S.		S.E. $\frac{1}{2}$ E.		S.W. $\frac{1}{2}$ W.	

COMPARTMENT XIX.

On the parallel of 57° N.

Hours.	2° W.		1° W.		°	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S. W. by S.	Greatest rate $1\frac{1}{2}$ knots at half tide.	S. by W. $\frac{1}{2}$ W.	Greatest rate $1\frac{1}{2}$ knots at half tide.	S. by W. $\frac{1}{2}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.
	2 S. W. by S.		S.W. $\frac{1}{2}$ S.		S.S.W.	
	3 S. W. $\frac{1}{2}$ W.		S.W.		S. by W.	
	4 N. $\frac{1}{2}$ W.		W.S.W. $\frac{1}{2}$ W.		S. by W.	
	5 Slack.		Slack.		S. $\frac{1}{2}$ E.	
	6 N.N.E. $\frac{1}{2}$ E.		N. by E. $\frac{1}{2}$ E.		Slack.	
Before High Water, Dover.	5 N.E. $\frac{1}{2}$ N.	Greatest rate $1\frac{1}{2}$ knots at half tide.	N.N.E.	Greatest rate $1\frac{1}{2}$ knots at half tide.	N.N.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.
	4 N.E.		N.N.E.		N. by E.	
	3 N.E. by N.		N.N.E. $\frac{1}{2}$ E.		N. by E. $\frac{1}{2}$ E.	
	2 N.E. by N.		N.E. $\frac{1}{2}$ N.		N.N.E. $\frac{1}{2}$ E.	
	1 South.		E.N.E.		N. by E. $\frac{1}{2}$ E.	

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.S.W. $\frac{1}{2}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.	N. by E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	S.S.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	S.W. $\frac{1}{2}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.
	2 S.W. $\frac{1}{2}$ S.		S. $\frac{1}{2}$ E.		South.		N.W. by W. $\frac{1}{2}$ W.	
	3 S.S.W. $\frac{1}{2}$ W.		S. by E.		S. by W. $\frac{1}{2}$ W.		W.N.W.	
	4 S.W. $\frac{1}{2}$ S.		S.E. by S.		S.W. by W. $\frac{1}{2}$ W.		N. by W. $\frac{1}{2}$ W.	
	5 Slack.		E. by S.		Slack.		N. by W.	
	6 N.E. $\frac{1}{2}$ E.		E. $\frac{1}{2}$ N.		Slack.		N. by E.	
Before High Water, Dover.	5 N.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	E. $\frac{1}{2}$ N.	Greatest rate $\frac{1}{2}$ knot about half tide.	Turning.	Greatest rate $\frac{1}{2}$ knot about half tide.	N.N.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.
	4 N. E. by E.		E. by N.		N.E. by N.		N.E. $\frac{1}{2}$ N.	
	3 E.N.E. $\frac{1}{2}$ E.		East.		N.E. $\frac{1}{2}$ E.		N.E. by E. $\frac{1}{2}$ E.	
	2 E.N.E. $\frac{1}{2}$ E.		East.		E. by N.		E.N.E.	
	1 Slack.		S. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		E. $\frac{1}{2}$ S.	

COMPARTMENT XIX.—continued.

Hours.	5°		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. by E. $\frac{1}{4}$ E.	Greatest rate $\frac{1}{3}$ knot about half tide.	8. by E.	Greatest rate $\frac{1}{4}$ knot about half tide.	E.N.E.	Greatest rate $\frac{1}{4}$ knot about half tide.	S.S.E.	Rate 0.9 knot.
	2 N.E. by N.		South.		E.N.E. $\frac{1}{4}$ E.		Slack.	
	3 S.W.		S. by W.		E.N.E.		N.E. by N.	
	4 N.N.W.		N.N.E.		E.N.E.		N.E. $\frac{1}{4}$ N.	
	5 N. $\frac{1}{4}$ W.		North.		E.N.E.		North.	
	6 N. by E. $\frac{1}{4}$ E.		North.		N.N.E.		N. by E.	
Before High Water, Dover.	3 N.E.	Greatest rate $\frac{1}{3}$ knot about half tide.	N. by E.	Greatest rate $\frac{1}{4}$ knot about half tide.	N.E. $\frac{1}{4}$ E.	Greatest rate $\frac{1}{4}$ knot about half tide.	N.E. $\frac{1}{4}$ E.	Rate 0.9 knot.
	4 N.E.		N.N.E. $\frac{1}{4}$ E.		N.E. by N.		N.N.E. $\frac{1}{4}$ E.	
	5 N.E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ E.		N.E.		N.E. by E. $\frac{1}{4}$ E.	
	2 E. $\frac{1}{4}$ N.		E. by N.		N.E.		N.E. by E. $\frac{1}{4}$ E.	
	1 East.		E. by N.		N.E.		E.N.E. $\frac{1}{4}$ E.	

COMPARTMENT XX.

On the parallel of 58° N.

Hours.	3° W.		2° W.		1° W.		°	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 South.	Greatest rate 1 knot about half tide.	S.E.	Greatest rate 0.6 knot about half tide.	S.S.W.	Greatest rate 1 knot about half tide.		
	2 S.E. $\frac{1}{4}$ S.		S.E.		S.S.W.			
	3 East.		S. $\frac{1}{4}$ E.		S.S.W.			
	4 E. by S.		S.E. $\frac{1}{4}$ S.		Slack.			
	5 Slack.		Slack.		N.N.W. $\frac{1}{4}$ W.			
	6 S.W.		N. by W.		N.N.E.			
Before High Water, Dover.	3 W. $\frac{1}{4}$ N.	Greatest rate $\frac{1}{3}$ knot about half tide.	N.W. $\frac{1}{4}$ W.	Greatest rate $\frac{1}{4}$ knot about half tide.	N.N.E. $\frac{1}{4}$ E.	Greatest rate $\frac{1}{4}$ knot about half tide.		
	4 W.N.W. $\frac{1}{4}$ W.		N.W.		N.E.			
	5 N.W. by W. $\frac{1}{4}$ W.		N.W. by N.		N.E. $\frac{1}{4}$ E.			
	2 W. by N.		W. $\frac{1}{4}$ N.		S.S.E. $\frac{1}{4}$ E.			
	1 W. $\frac{1}{4}$ N.		S. $\frac{1}{4}$ E.		S.S.E. $\frac{1}{4}$ E.			

Hours.	1° E.		2° E.		3° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.W.	Greatest rate $\frac{1}{4}$ knot about half tide.	S.W.	Greatest rate $\frac{1}{4}$ knot about half tide.	S. by E.	
	2 West.		W.S.W.		S. $\frac{1}{4}$ E.	
	3 Slack.		W.N.W. $\frac{1}{4}$ W.		S. $\frac{1}{4}$ W.	
	4 Slack.		N.W. $\frac{1}{4}$ N.		S.S.W.	
	5 N.N.E.		N. $\frac{1}{4}$ E.		S. $\frac{1}{4}$ W.	
	6 N.N.E.		N. by E.		E. by N.	
Before High Water, Dover.	3 N.N.E.	Greatest rate $\frac{1}{3}$ knot about half tide.	N. by E.	Greatest rate $\frac{1}{4}$ knot about half tide.	E.N.E.	
	4 N.N.E.		N. by E. $\frac{1}{4}$ E.		E.N.E.	
	2 N. by E. $\frac{1}{4}$ E.		N. by E.		E. by N.	
	1 Turning.		N.E. $\frac{1}{4}$ E.		E.S.E. $\frac{1}{4}$ E.	
			S.E.		S.E. by E.	
	W. by N. $\frac{1}{4}$ N.					

TIDAL STREAMS.

COMPARTMENT XXI

On the parallel of 59° N.

Hours.	2° W.		1°		•	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.W. by S.	Greatest rate 1 knot about half tide.	S.S.W. ½ W.	Greatest rate 0·6 knot about half tide.	W.S.W.	Greatest rate ¾ knot about half tide.
	2 S. by W. ¾ W.		S.W. by S.		W.S.W. ¾ W.	
	3 S. ¾ W.		S.W. by S.		N. by E. ½ E.	
	4 S.W. by W. ½ W.		Slack.		N.E.	
	5 W. by N.		Slack.		N.E. ¾ E.	
	6 N.W. ½ W.		N. ¾ E.		N.E. by E.	
Before High Water, Dover.	5 N.N.W. ¾ W.	Greatest rate 1 knot about half tide.	N.N.W.	Greatest rate 0·6 knot about half tide.	N.E. by E.	Greatest rate ¾ knot about half tide.
	4 N.W. ½ N.		N.N.W.		E. by N.	
	3 W.N.W.		N.W. by N.		S.E. ¾ E.	
	2 S.W. by W. ½ W.		S.W. by W. ¾ W.		S.S.W. ½ W.	
	1 S.W. ¾ W.		S.W. ¾ S.		W.S.W.	

All the foregoing bearings are magnetic.

TIME
OF
HIGH WATER ON FULL AND CHANGE DAYS ;
WITH THE RISE OF THE TIDE
AT SPRINGS AND NEAPS.

AUTHORITIES.

Admiralty Charts. Alldridge, Barnett, Bate, Bayfield, Beaufort, Becher, Bedford, Beechey, Belcher, Biddlecombe, Blackwood, Boteler, Bullock, Burdwood, Calver, Church, Collinson, Cox, Dayman, Denham, Drury, Edye, Evans, Fitz-Roy, Flinders, Frazer, Hewett, Hoskyn, Hutchison, Kellett, King, Lawrance, Lord, Mackenzie, Mooney, M'Dougall, Mudge, Orlebar, Otter, Owen, Parry, Raper, Reed, Richards, Robinson, Roe, Ross, Sheringham, Shortland, Skead, Slater, Spence, Stanley, Stanton, Stokes, Sullivan, Thomas, Vidal, Ward, Washington, White, Wickham, Williams, Wolfe, Wood, and Yule, of the Royal Navy ; and Blair, Constable, Haines, Horsburgh, Moresby, Robinson, Ross, Stiffe, Wales, and Ward, of the Indian Navy. Maclear, H.M. Astronomer at the Cape of Good Hope.

Pilote Français. Beautemps-Beaupré, Bégat, Bougainville, Chazallon, D'Entrecasteaux, D'Urville, Duperrey, Givry, La Pérouse, and Roussin of the French Navy.

Bellingshausen, Krusenstern, Lisiansky, and Lütke of the Russian Navy.

Tasman, Melville, Smits, Swart, and Van Rhyn of the Dutch Navy.

Klint, Löwenorn, and Zahrtmann of the Danish and Swedish Navies.

Bauza, Malaspina, and Tofiño of the Spanish Navy.

U. S. Coast Survey under Professor A. D. Bache. Maury and Wilkes of the U. S. Navy.

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As it is desirable that the following list should be made accurate and complete, it is requested that corrections and additions be forwarded to the Secretary of the Admiralty.

TIME

OF

HIGH WATER ON FULL AND CHANGE DAYS

AT THE PRINCIPAL PLACES ON THE GLOBE;

AND ACCORDING TO THE APPARENT PROGRESS OF THE TIDE WAVE

*With the Rise of the Tide at Springs and Neaps.**

thus ?, is placed after the Time of High Water and the Rise, it indicates that what are given are approximations.)

		High Water, Full and Change.		Rise.		Place.	High Water, Full and Change.		Rise.	
				Springs.	Neaps.		Springs.	Neaps.		
<i>England, South Coast.</i>										
	h. m.	ft.	ft.				h. m.	ft.	ft.	
Torbay	4 30	16	12	Torbay	-	-	6 0	13½	10	
Exmouth	4 27	16	12	Exmouth	-	-	6 21	12½	8½	
Lyme Regis	4 30	16½	12½	Lyme Regis	-	-	6 21	11½	8½	
Bridport	5 0	14½	10½	Bridport	-	-	6 5	11½	7½	
Chesilton	4 35	14½	11½	Chesilton	-	-	6 13	10½	7	
Portland Break- water	4 43	15½	11½	Portland Break- water	-	-	7 1	6½	4½	
Poole	4 57	16	12	Poole	-	-	9 10	6½	4½	
Christchurch	5 5	10	6	Christchurch	-	-	12 45			
Needles Point	5 4	15½	12	Needles Point	-	-	9 0	5		
Hurst, Camber	5 14	15	11½	Hurst, Camber	-	-	9 46	7½	5	
Yarmouth	5 26	16	13	Yarmouth	-	-	10 0	7½	6	
West Cowes	5 37	15½	11½	Yarmouth	-	-	12 0	7	6½	
Lymington	5 32	15½	11½	West Cowes	-	-	10 45	12½	9½	
Beaulieu	5 43	15½	11½	Lymington	-	-	11 45			
Calshot	5 45	15	11	Lymington	-	-	10 25	8	6	
(Castle Point)	5 47	14½	10½	Beaulieu	-	-	12 15			
Southampton	5 55	13½	9½	Beaulieu	-	-	10 25	10	8½	
Red- bridge	6 6	12½	8½	Calshot	-	-	12 15			
Portsmouth Dock	6 12	10½	6½	Calshot	-	-	11 30	13	9½	
Yard	6 17	5½	1½	(Castle Point)	-	-	10 30	13	9½	
Port- chester (off the Castle)	5 47	14½	10½	Southampton	-	-	12 45			
Port- bridge (a ½ mile W. of bridge)	5 47	8½	4½	Red- bridge	-	-	10 42	6½	6	
	5 37	16½	11½	Portsmouth Dock	-	-	12 57			
	5 40	16½	11½	Yard	-	-	11 41	12½	10	
	5 47	16½	11½	Port- chester (off the Castle)	-	-				
	5 45	15½	11½	Port- bridge (a ½ mile W. of bridge)	-	-	11 46	13½	10½	
	5 41	15	11½		-	-				
	5 46	10			-	-				
	6 16	14½	10½		-	-	11 48	6½†	4†	
	6 0	13	9½		-	-				

* of the tide is meant its vertical rise above the mean low water level of spring-tides.

† Above the bed of the lake.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Portsmouth Fareham (in Channel close to the Upper Quay) -	11 48	11½	8½	Caldy Island -	6 0	24½	
Bridge -	11 51	7½	4½	Tenby -	6 0	27	
Ryde -	11 20	13½		Milford (St. Ann Lighthouse) -	5 56	24	
Bembridge Point -	11 0	14	10½	Pembroke Dk. Yard	6 12	21	
Chichester -	11 30	15	11	Benton Castle, Cleddau R. }	6 23	20	
Pagham (entrance)	11 30	16½	12½	Landshipping " }	6 27	20	
Selsea Bill -	11 45	16½	12½	Little Milford Quay " }	6 31	19	
Littlehampton -	11 36	16	11½	Haverfordwest " }	6 42	7½	
Arundel (Bar) -	11 35	16	11½	Smalls Light-house " }	6 0	21	
Arundel (Town) -	12 25			Ramsay Sound -	6 0	17	
Shoreham -	11 34	18	13½	Fishguard -	6 56	11½	
Brighton -	11 15	19½	16	Newport -	7 0	12	
Newhaven -	11 51	20	15	Cardigan -	7 1	12	
Beachy Head -	11 20	20	15	New Quay -	7 30	15	
Hastings -	10 53	24	17½	Aberystwyth -	7 31	13½	
Rye Bay -	11 20	22	17½	Aberdovey -	8 0	15	
Dungeness -	10 45	21½	19	Sarn-y-bwch Reef -	7 40	14	
Folkstone -	11 7	20	16½	Barmouth -	7 41	17	
Dover -	11 12	18½	15	Sarn Badrig -	7 30	13	
Dunbar -	11 15	16	12½	Port Madoc -	7 30	17	
Ramsgate -	11 44	15	12	St. Tudwall Road -	7 45	14	
<i>England and Wales, West Coast.</i>				Pwllheli -	7 46	13½	
Scilly Isles (St. Agnes) -	4 30	16	12	Bardsey Id. -	7 40	15	
Scilly Isles (St. Mary) -	4 27	16	12	Porth-dyn-lleyn -	8 30	16	
Cape Cornwall -	4 35	18½	13½	Caernarvon -	9 33	13½	
St. Ives -	4 44	21	15	Holyhead -	10 11	15	
Padstow -	5 13	20½	16½	Amlwch -	10 30	15½	
Boscawen -	5 15	25	17½	Beaumaris -	10 32	21½	
Budehaven -	5 45	23	17	Air Point, R. Dee	10 54	25	
Lundy Island -	5 15	27	20	Chester (Crane Wharf) -	12 16	26	
Barnstaple (Bar) -	5 30	19	14	Liverpool -	11 23	26	
Barnstaple (Bridge)	6 28	10½	7½	Formby Point -	10 35	24	
Appledore -	5 58	23	16½	Ribble Lighthouse	10 51	24	
Bideford -	6 7	16	12	Preston -	11 49	10	
Ilfracombe -	5 42	27½	21½	Fleetwood (Wyre Lt)	11 11	27	
Minehead -	6 30	35	26½	" (Port)	11 12	26½	
Bridgewater Bar -	6 50	35	26½	Lancaster -	11 16	24½	
Weston-super-mare	6 54	37	28½	Poulton-le-Sands	11 26	27½	
Flatholm Islands -	6 54	37½	28½	Piel Harbour (Pier)	11 5	28	
Portishead -	7 16	41½	31	Whitehaven -	11 14	23½	
Bristol (King Road)	7 58	44	33	Port Harrington -	11 5	26	
Chepstow -	7 30	38	28½	Workington -	11 4	20	
Newport -	7 10	36	29	Maryport -	11 3	18	
Cardiff -	6 59	38	29	Abbey Head -	11 10	23	
Nash Point -	6 25	33	25	Southernness -	11 20	28	
Swansea (Mumbles Lighthouse) }	6 1	27½	20½	Annan Foot -	11 56	20	
Porth Cawl -	6 8	28½	21½	Port Carlisle -	12 10	20	
Burry Port -	6 1	25½	18½	Point of Ayr -	11 7	20½	
Llanelli (Bar) -	6 16	28	21	Douglas, I. of Man	11 12	20½	
Caermarthen (Bar)	6 10	26	19½	Ramsey " }	11 12	19½	
				Peel " }	11 8	16½	
				Calf Sound " }	11 17	16½	
				Port St. Mary " }	11 10	20	
				Castletown " }	11 10	20	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Scotland, West Coast.							
	h. m.	ft.	ft.		h. m.	ft.	ft.
Tarn Point)	11 22	23	18	Duart, I. of Mull -	5 0	12	10
bright -	11 10	23		Loch Aline -	5 33	13½	10½
Stewart } Quay) -	12 0	12	6	Tobermory " -	5 36	13	9½
-	11 30			Loch Sunart -			
own -		17	12	Iona Sound -	5 11	11½	8½
Uiam -	11 10	18	10	Bunessan -	5 24	12	8½
Jalloway -	11 15	15½	12½	Loch Tuadh (Go-	5 29	11½	8
rick -	11 10	15	12	metra) I. of Mull }			
an -	11 12	11	8	Scarnish, Tiree I.	5 31	11½	8½
Antyre -	10 35	4		Arinagour, Coll I.	5 39	12½	9½
lton -	11 45	8½	6	Loch Moidart -	5 44	13½	9½
-	11 49	10	7	Arasaig -	5 50	13½	10
-	11 50	8½	7½	Loch Nevis -	5 47	14½	10
-	11 50	10	7½	Loch Houra -	5 45	13½	10½
n -	11 45	10	8	Ornsay, I. of Skye	5 50	14½	10½
Head -	11 49	10		Kyle Rhea -	6 0	15	11
Great }				Loch Duich -	6 0	15½	11
rae -	11 50	10	6	Loch Alah (Kyle	6 16	15½	11
-	11 50	10		Akin) -			
-	0 8	9½	8½	Loch Carron }	6 29	16½	11½
sgow -	0 18	9		(Plockton) -			
on -	0 20	9		Portree, I. of Skye	6 32	15	10½
-	0 39	9		South Rona, Light }	6 20	14½	10½
(Canal }				House -			
ice) -	1 15	9		Loch Torridon -	6 20	15	11
-	1 25	9	7½	Barra, North Harb.	5 48	11½	8½
ng -	12 6	12		Canna Island -	6 19	14	9½
g -	12 6	10	6	Loch Boisdale, }	5 47	12½	9½
ivan -	11 55	6		South Uist }			
es, Kyles }	11 50	10	8	Loch Dunvegan }	6 7	15½	11
-	11 50	9	6	(Dunvegan Cas-			
ig, Loch }	11 53	11	7½	tle, I. of Skye) }			
-	12 0	10		Kallin, North }	5 39	13½	9½
und -	2 22	4	2½	Uist -			
n, Islay -	5 0	5	4½	Monach Islands }	5 44	12½	8½
lin Ferry -	4 41	6½	4½	(Shillay) -			
all Isles -	5 3	3½	2½	Loch Eport, N. Uist	6 6	12½	9½
-	4 49	6½	5	Loch Maddy, }	6 6	12½	9½
land -	5 2	11½	7	North Uist }			
-	5 28	10	7½	Vallay -	6 10	11½	8½
ound -	5 10	10-12		Berneray I. (Sound	6 11	13	9½
an, Loch }	5 31	9	6½	of Harris) -			
m -	5 22	12	9½	Obb of Harris -	6 16	11½	8½
l, Loch }	7 3			East Loch Tarbert	6 10	13½	10
-	7 54	5½		West Loch Tarbert	6 4	11½	8½
in, Loch }	5 26	12½	8½	Loch Seaforth }	6 16	15	10
-				(Athline) -			
ish, }	5 43	11		Loch Clay -	6 9	14½	9½
evan -	5 43	12	8½	Loch Ewe (Poolewe)	6 39	14½	10½
och Aber -	5 59	11½		Loch Broom }	6 40	14½	10½
(Head of) }	6 27			(Ullapool) -			
-				Tanera, Summer I.	6 37	14	10½
				Loch Inver -	6 41	14	11
				Loch Erisort, }	6 43	15½	11½
				Lewis Id. -			
				Stornoway -	6 46	13½	9½
				Loch Roag (Ber-	6 11	11	
				nera) Lewis I. -			
				St. Kilda -	5 30		
				Rockall -	3 30	12	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>h.</i>	<i>m.</i>		<i>h. m.</i>	<i>h.</i>	<i>m.</i>
Loch Laxford -	6 44	15	11½	<i>England, East Coast.</i>			
Cape Wrath -	7 30	15½		Holy Island Harb.	2 30	15	
Loch Eriboll -	7 43	14½	11	North Sunderland	2 30	15	
Loch Tongue -	7 53	15	12	Coquet Road -	3 0	14½	
Thurso -	8 28	14½	11	Blyth -	3 16	15	
Stroma, S. side -	9 47	9	6½	Tyne River (Bar)	3 20	14½	
Swona, E. side -	10 24	10	7½	" North Shields }	3 23	13½	1
" W. side -	9 35	10	7	(Low L. Hse.) }			
Great Skerry, E. side }	11 4	9½	6	" Howden -		15	
" W. side -	10 53			" Walker -		10½	
<i>Orkneys.</i>				" Newcastle -	4 23	10½	
Stromness -	9 0	10	7½	Sunderland -		14½	
Westness -	9 11	10	7½	Seaham -	3 24	15½	
Kirkwall -	10 9	10	7½	Hartlepool -	3 28	15	
Deer Sound -	10 30	10	7½	Tees River, Bar -	3 45	15	
Widewall -	9 3	10	7½	" Middlesbrough	3 55	13	
Otterswick -	9 13	11	8	" Stockton -	4 40	11	
<i>Shetland Isles.</i>				Whitby -	3 45	15	
Balta -	9 45	6	4½	Scarborough -	4 11	15½	
Lerwick -	10 30	6	4	Filey Bay -	4 20	16	
Hillswick, or Urie }	9 45	6½	5	Flamborough Head	4 30	16	
Firth -				Bridlington -	4 39	16	
Sealloway -	9 30	5½	4½	Humber River, }	5 26	18½	1
Sumburgh Head -	9 45			Spurn Point -			
Fair Isle -	11 0	5	3½	" Grimsby -	5 36	19½	
<i>Scotland, East Coast.</i>				" Killingholme	6 2	19½	
Duncansby Ness -	10 14	10	7	" Hull -	6 29	20½	
Wick -	11 22	10	7½	Humber Ouse }	7 44	14	
Dornock Road -	11 47	11		River, Goole }			
Cromarty -	11 56	14	11	Boston Deep, Clay }		21½	
Inverness (Kellock Pier) }	12 18	12	9½	Hole -			
Banff -	0 28	10½	8	" Hob Hole -		17	
Fraserburgh -	0 40	11	8½	" (Sluice) -	7 0	12	
Peterhead -	0 34	10½	8½	Lynn Deep, Long }	6 0	11	
Aberdeen -	1 0	12	10	Sand -			
Stonehaven -	1 10	11	11	" Lynn Road -		20	
Montrose -	1 25	13	10	" Lynn -		18	
Arbroath -	1 35	14	11	Wisbeach Eye -		20	
Tay River (Bar) -	2 6	16	14	Sutton Bridge -		18	
Broughty Ferry -	2 22	14½	11	Wisbeach -	7 30	15	
Dundee -	2 32	14½	11½	Wells Bar -	6 20	15	
Perth -	3 35			Wells -	7 0	12	
Cockenzie, Firth of }	2 16	15½	13	Blakeney Bar -	6 30	15	
Forth -				Blakeney -		9	
Leith -	2 17	16½	12½	Cley -		5½	
Granton Pier -	2 20	16	12½	Cromer -	7 0	14½	
Burntisland -	2 24	16½	12½	Leman Shoal -	6 0		
Queensferry -	2 37	18	11	Ower Shoal -	6 30		
Kinncardine -	2 53	17½	15	Hammond Knoll -	7 40		
Alloa -	3 18	17½	15	Winterton Ridge -	7 50		
Stirling -	3 52	7½	4½	Yarmouth Road -	9 15	6	
Dunbar -	2 8	14½	11	" Haven, Bruah }		5½	
Eyemouth -	2 15	15½	11½	Bridge -			
Berwick -	2 18	15	11½	Lowestoft -	9 57	6½	
				Blyth River, South }	10 20	6½	
				wold -			
				Aldborough -	10 45	8½	
				Kentish Knock -	11 47		
				Orfordness -	11 15	8	

	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
-	11 30	67	67	Youghal -	5 14	12½	10
en Bar	11 30	7½		Ballinacourty, } Dungarvan - }	5 12	12½	9½
iden -	12 36	7½		Dunmore -	5 27	12½	9½
Bridge	1 0	7½		Waterford (Dun- cannon Fort) - }	5 20	12½	10
haven }	3 0	6		(Bridge) -	6 6	13½	10½
-	11 43	12	9	New Ross -	6 4	12½	10
on Quay	12 35	10		Saltees -	5 40		
d Bridge	12 55	7		Wexford -	7 21	5	3½
rbour	12 6	11½	9½	Kilmichael Point -	8 30	4½	3
-	12 6	12½	10	Arklow -	8 45	4	3
r, Pin- }	12 20	12		Wicklow -	10 29	9	6½
oham }	12 27	11		Bray Head -	10 45	12	9½
ch -				Dalkey Island -	10 45	13	11
r, Pin- }	12 35	13½		Kingstown -	11 10	11	8½
rich - }				Dublin Bar (Pool- beg Lt. House) }	11 12	12-14	9-11
River, }	12 29	12		Howth Harbour -	11 9	13	10
y Quay	12 48	11½		Malahide Inlet -	11 15	10	11
rade }	1 8	4½		Rogerstown Inlet -	11 15	10½	11
dge -				Skerries Islands -	11 0	13	10
Colne }	12 0	14	10	Balbriggan -	10 40	11	
-				Drogheda (Bar) -	11 0	11½	9
hoe -	12 10	15	10½	Dundalk -	10 56	13½	11½
River, }				Greencastle Point -	11 2	14	11½
nt - }	12 0	14½	11	Carlingford (Bar) or Cranfield Point.	11 0	14	11
idge -	12 20	12	8	„ Warrenpoint -	11 10	14½	12
River, }	12 32	10	6	Newcastle -	10 30	16	12
l, N.E. }	11 40	12	8	Ardglass -	11 0	16	12
-				South Rock -	10 58	13	10½
River, }	12 5	14½	10½	Lough Strangford }	10 53	14	11½
Bridge	12 25	16	11	(Killard Point) }			
at -	12 5	14½	10½	„ Strangford }	12 31	10½	8½
-	11 40	15½	13	„ Quoile Quay -	12 45	11	9½
le -	12 0	15½	13	„ Kircubbin -	12 42	11½	9½
-	12 30	15½	13	„ Killyleagh -	12 40	11	9½
-	0 37	16	13½	Head of the Lough }			
-	1 2	17½	14	(Turley Rocks) }	12 44	11½	9½
-	1 10	17½	14				
-	1 37	18½	15½				
-	1 43	19	16				
ks -	1 57	19½	17				
lge -	2 7	19½	16½				
<i>Ireland, South and East Coasts.</i>				<i>Ireland, West Coast.</i>			
-	4 0	11	6½	Cape Clear -	4 0	9	6½
-	4 23	10½	8½	Skull -	4 2	9½	7½
end -	4 21	10½	8	Crookhaven -	4 9	9½	8
ay -	4 30	11	8½	Dunmanus Harbour	3 57	9½	7½
erry -	4 36	10½	8½	Dunbeacon -	3 51	10½	7½
-	4 43	11½	9	Black Ball Harbour	3 40	9½	7½
-	5 1	11½	9	Castletown, Bear- haven - }	4 14	9½	7½
onrose }	4 58	12½	10	Bantry Harbour -	3 47	10	7½
-	4 54	12	9½	Kenmare R., Bal- lycrovane }	3 42	10½	7½
				„ Dunkerron -	3 45	10½	8
				„ Ormond -	3 43	10	7½
				„ West Cove -	3 52	10	7½
				Ballinskellig Bay -	3 40	12	7½

Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.
Valentia Harbour -	h. m.	ft.	ft.
Ventry -	3 42	11	8
Blasket Islands -	3 44	10½	7½
Dingle -	3 30	11½	8
Smerwick -	3 51	10½	7½
Tralee Bay (Fenit) -	3 50	11½	8
R. Shannon, Kil- baha - }	4 3	12½	9½
" Kilrush -	4 16	13	9½
" Carriga- holt - }	4 42	14	10½
" Tarbert -	4 44	14	10½
" Foynes Id. -	4 57	14½	10½
" Mellon -	5 35	15½	12
" Limerick -	6 1	18½	13½
Liscanor Bay -	6 16	18½	13½
Mutton Island -	4 23	13½	10
Galway -	4 20	13½	9½
Killeany, Arran Ids. -	4 35	14½	11
Cashla Bay -	4 28	13½	10
Kilkieran Cove -	4 33	16	12
Greatman Bay -	4 34	15½	11
Roundstone -	4 39	15½	11½
Slyne Head -	4 28	13½	10½
Clifden Bay -	4 30	13½	10
Ballynakill Bay -	4 30	13½	10
Inishbofin -	4 40	12½	9½
Inishturk -	4 34	12½	9½
Clare Island -	4 36	12½	9½
Westport -	4 38	12½	9½
Achillbeg -	4 57	12½	9½
Bulls Mouth, (N. entrance of Achill Sound) - }	5 14	10½	8
Blacksod Bay } (Quay) - }	5 38	10½	7½
Broadhaven Harb. -	4 47	10	8½
Killala Bay -	5 0	10½	7½
Sligo Bay -	5 22	10½	8
Ballysadare (Quay) -	5 18	11½	8½
Sligo Harbour } (Oyster Island) }	6 0	8½	5½
Ballyshannon (Bar) -	5 23	11½	8½
Donegal Harbour } (Saltil Quay) }	5 18	11½	8½
Teelin Harbour -	5 16	11½	8½
Killybegs -	5 16	11½	8½
Lough Rossmore -	5 16	11	8
Rutland Island -	5 20	11	8
Gweedore (Bunbeg) -	5 22	11	8
<i>Ireland, North and East Coasts.</i>			
Ballyness (Bar) -	5 22	11½	8½
Sheephaven -	5 32	11½	8½
Mulroy Bay, (Bar) -	5 40	11½	8½
" Fanny Hole -	6 17	9½	8
" Seamount Bay -	6 44	7½	8
" Cranford Bay -	8 3	4	2½
Rathmullan, Lough } Swilly - }	5 42	12½	9

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Beasin	8 57	20	15 $\frac{1}{2}$	Elbe, Hamburg	5 29	6 $\frac{1}{2}$	
les	9 7	20	15 $\frac{1}{2}$	Eider, Tonning	2 1	9	
m	9 38	21	16	" Friederich-	2 37	9	
-	9 36	21	17 $\frac{1}{2}$	stadt			
-	9 39	21	16	Eider, Rendsborg	7 42	4	
-	9 29	23 $\frac{1}{2}$	18	Husum	2 36	9	
uf	10 6	9 $\frac{1}{2}$	7 $\frac{1}{2}$	List	2 21	6	
-	10 57			Hierling	2 45	5	
-	9 51	22	18	Nyminde Gab	2 41	2	
-	2 28			Thorsminde	3 34	2	
-	10 44	23 $\frac{1}{2}$	18	Blaavand or Horn	1 44	5	
y-en-Caux	10 46	27	21 $\frac{1}{2}$	Point			
-	11 6	27	20 $\frac{1}{2}$	Aggerminde	4 9	2	
-	11 9	27	21	Hirtshals	4 28	1	
-	11 5	27 $\frac{1}{2}$	21	Skagen or the Skaw	5 56	1	
-	11 26	27 $\frac{1}{2}$	21	Bergen	1 30	4	
lery-sur-	11 46	27	21 $\frac{1}{2}$	Romdals Islands	10 45	6	
-				Ramso Fiord	10 45	7	
-	11 25	25	19 $\frac{1}{2}$	Oxbasheia	12 0	8	
snuez	11 37	21 $\frac{1}{2}$	16 $\frac{1}{2}$	Trø Islands	11 45	7	
-	11 49	19 $\frac{1}{2}$	15 $\frac{1}{2}$	Værø	12 0	9	7 $\frac{1}{2}$
es	12 0	19	15	Lofoten Islands	12 0	9	7 $\frac{1}{2}$
ue	12 8	16 $\frac{1}{2}$	13 $\frac{1}{2}$	Tromsø	1 45	8	
				Hammerfest	1 10	9	
<i>North Sea, East Coast.</i>				<i>Færoe Islands.</i>			
-	12 18	16	13	Fuglœ Fiord	11 15	6 $\frac{1}{2}$	4 $\frac{1}{2}$
-	12 25	19	15	Svinœ Fiord	12 0	6 $\frac{1}{2}$	4 $\frac{1}{2}$
berg	12 48	13	11	Leervig Fiord	0 30	6 $\frac{1}{2}$	4 $\frac{1}{2}$
-	3 15	15		Miaveness	3 12	6 $\frac{1}{2}$	4 $\frac{1}{2}$
-	1 20	15		Naalsœ Fiord	4 0	6 $\frac{1}{2}$	4 $\frac{1}{2}$
-	4 25	15		Skaapen Fiord (be-			
-	1 20	15		tween Stormœ	5 0	9 $\frac{1}{2}$	7 $\frac{1}{2}$
spot	12 30	12	8	and Sandœ)			
-	2 0	11	9	" (be-			
shaven	2 15	10	8	tween Hestœ	5 30	9 $\frac{1}{2}$	7 $\frac{1}{2}$
West Gat)	1 45	7		and Sandœ)			
tsluis	2 30	8	6	Waagœ Fiord	6 0	9 $\frac{1}{2}$	7 $\frac{1}{2}$
-	3 0	5		Westmanshaven	8 0	9 $\frac{1}{2}$	7 $\frac{1}{2}$
m	3 45	7		Suderoe Fiord	6 0	9 $\frac{1}{2}$	7 $\frac{1}{2}$
-	2 30	5		Myggenæs Fiord	9 0	9 $\frac{1}{2}$	7 $\frac{1}{2}$
wide shoals)	6 30	4	3 $\frac{1}{2}$	Eides Fiord	11 0	9 $\frac{1}{2}$	7 $\frac{1}{2}$
-	7 0	12					
dep	7 27	4	3 $\frac{1}{2}$	<i>Iceland.</i>			
ling (West)	8 40	6	5	Reikiavik	5 0	17 $\frac{1}{2}$	13 $\frac{1}{2}$
l Gat	9 0	7					
Iollum Rd.	11 30	7		<i>Lapland.</i>			
ter buoy)	10 0	8-10		Liza Bay	5 58	■	
(road)	10 30	8-10		Nova Zembla Harb.	6 36	10	
-	11 15	8-10		Jekatarina Islands	6 23	10	
-	12 0			Kildin Island	6 45	12	
ey	10 30	■		Habitable Island,	7 9	9	
ater light }	11 30			Seleney Bay			
-				Teriberka River	7 20	12	
Oog	12 0	9 $\frac{1}{2}$	7	Olenji Islands	7 30	12	
nd	11 33	9 $\frac{1}{2}$		Charlowka River	8 8	12	
trance	12 0	11		Seven Islands	8 20	12	
ixhaven	1 8	10		Jukan Islands	9 0	13	
unsbuttel	1 58	9		Sviatol Nos	9 15	14	
ackstadt	2 9	10					
	5 19	7					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	N
White Sea.					h. m.	ft.	
Inkanskie -	9 15	14	ft.	Walvisch Bay -	1 54	6	
Turna Bay -	9 54	11		Port Alexander -	3 0	5	
Trek Island -	10 48	20		Great Fish Bay -	2 30	5-6?	
Litke Bank -	11 45	15		Little Fish Bay -	2 30		
Cape Kanushin -	11 54	15		Lobito Bay -	2 20	5	
Sosnovets -	11 44	18		Benguela -	2 30	5?	
Morjovets I. -	11 20	17		St. Helena Island -	3 11	3	
Cape Voronov -	11 20	17		Ascension Island -	5 30	2	
Intsi Point -	11 55	16		San Paul de Loanda	4 30	5	
Kouloi River -	1 15	20		River Congo -	4 30	6	
Mezen -	1 48	15 - 22		Mayumba -		7	
Kerets Point, Gulf } of Arkhangel - }	4 30	5½		River Gaboon -	5 30	3	
Nikolskoi Tower „	6 0	2		Cape Lopez -	4 30	4-6?	
Moudinga I. „	5 50	3½		Corisco Bay } (Elobey Isles) - }	5 0	7	
Dvina Bar -		3½		Anno Bom Id. -	3 45	5	
Arkhangel „	7 28	2½		St. Thomas Id. -	3 25	4½	
Nikolskoi Chan. „	5 25	3		Princes Id. -	3 45	4½	
Gribanika Pt. „	4 50	3		Fernando Po -	4 0	7	
Jijginsk I. -	5 15	4		Cameroon River -	4 0?	6	
Cape Orlov Letni, } Gulf of Onega - }	5 18	4		Bonny and New } Calabar Rivers- }	5 0	9	
Onega River -	9 17	6 - 7		Brass River -	4 0	6	
Souma -	6 30	5½		River Niger, Nun } (entrance) - }	4 8	6	
Solovet Road -	5 0	4		„ Benin -	4 30	7	
Kyem River -	5 23	4		„ Middleton -	4 15	5	
Kalgalaksha -	6 50	7		„ Pennington -	4 15	5	
Keret, Gulf of } Kandalak - }	3 8	6		„ Dodo -	4 17	5	
Kovda Bay -	3 25	6		„ Ramos -	4 20	5	
Kandalaksha „	3 25	7		„ Forçados -	4 22	5	
Sosnovaia Bay „	2 40	6		„ Lagos (Bar) -	6 0	3	
Kou Zomen -	3 30	6		„ „ Consulate } Wharf }		2	
Tetrina -	3 17	7		„ Palaver Ids. -		1	
Nova Zembla.				Cape Coast Castle -	4 30	6	
Hakluyt Head -	1 30	4		St. George d'Elmina	4 30	6	
Spitzbergen.				Cape Three Points-	4 0	4	
Bell Sound -	8 56	3½		Axim -	4 30	4	
Africa, West Coast.				Grand Lahou -	4 20	4	
(From Cape of Good Hope to the Northward.)				Tabou River -	4 45	3 - 4	
Simons Bay -	2 44	5½	3¾	Cape Palmas -	4 30	4	
Hout Bay -	2 20	5		Sinou -	5 0	4	
Table Bay -	2 40	5		Sangwin River -	5 15	4	
Saldanha Bay -	2 0	6		Grand Cestos -	5 20	4	
St. Helena Bay -	2 30			Edina -	5 50	4	
Roodewall Bay -	2 30	6½		Junk River -	5 45	5	
Hondenklip Bay -	2 30	5½		Monrovia -	6 0	6	
Mc. Dougall Harb. -	2 30	5½		Gallinas River -	6 45	4	
Port Nolloth -	2 30	5½		Gilmorris Id. }	6 0	11	
Elizabeth Bay -		5 - 6		Sherbro River- }			
Angra Pequena -	2 30	8		Edmonstone Id. „		8	
Ichabo Island -	1 0	6	4	Bagroo River „		11	
Spencer Bay -	10 50	5 - 6		Banana Islands -	8 15	9	
Port d' Ilheo -	3 0	8 - 10		Sierra Leone -	7 55	8	
				Yellaboi Island -	7 10	10	
				Scarcies Rivers -	7 10	10	
				Mellacoree R. -	7 40	11	
				Forecarreah R. -	7 40	11	
				Mahneah R. -	7 40	11	
				Isles de Los -	6 35	13	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Ponga -	7 30	12	9½	Fayal, Azores -	11 45	11	
unez -	10 0	15	11½	Terceira " -	12 32	4½	
omponce -	10 0	15	11½	St. Michael " -	12 30	6	
Is. Or- } Channel - }	10 0	11		Funchal Bay, Ma- } deira - }	12 48	7	
Arcas } mel - }	10 10	11-14	9	Vigo -	3 0	12-13	
Bissao-	11 0	8		Cape Finisterre -	3 0		
Cacheo -	7 45	8		Port Camariñas -	3 0	15	
ambia -	8 10	6-9		Corunna -	3 0	15	
as River -	8 10	6		Ferrol -	3 0	15	
iver -	8 10	6		Cedeira -	3 0	15	
verde -	7 45	5		Vivero -	3 0	15	
d -	10 30			Rivadeo -	3 0	15	
Verde Ids.-	7 45	5		Barquero } (entrance) - }	3 0	15	
Praya " -	6 0?	5		Gijon Bay -	3 15	15	
dik -	10 0	6		St. Martin de la } Arena - }	3 30	15	
r Bay -	12 0	6-7		Santander -	3 30	15	12
iver -	12 0	8-9		Santona -	3 30	12½	10½
Blanco -	11 46	6		Bilbao (Bar) -	3 0	13	
lojador -	12 0	11		Olaveaga -	3 15	12	
uby -		8		Bilbao (Town) -	3 20	9	
Canary Ids. -	12 30?	9?		St. Sebastian -	3 0	11	9
" -	12 30?	9?		Port Passages -	3 0	12	9
" -	12 45?	9?		Socoa -	3 19	12½	8
ote " -	1 0?	9?		Bayonne (Bar) -	3 45	12	10½
ruz, Tenerife	1 30	8	6	Boucaut, Adour R. -	3 39	12½	6
de la Luz, }	12 52	10		Arcachon -	4 37	11½	9½
Canaria - }				Cordonan Lt. house -	3 37	13½	10½
Cruz or }	12 45	9		Royan -	3 38	13½	10
" - }				St. Surin -	4 11	14½	11
or -	1 18	10-12		Bordeaux -	6 50	14	12½
antin -	10 0	10		Ile d'Aix, Charente }	3 20	17	12½
-	1 46	9-12		R. Entrance - }			
ah -	1 30	9-12		Ile d'Oleron -	3 50	11	
r -	1 42	11		Rochefort -	4 6	17	13
-	2 6	3½	2½	Rochelle -	3 31	17	13
-	2 23	2½	1½	Les Sables d'Olonne -	3 26	16	10
(Goletta) -		3		Sandre River (en- }	3 31	16	11½
-	3 10	7	5	trance, - }			
<i>Europe, West Coast.</i>				Ile d'Yeu -	3 6	14½	10
-	12 0	3		Ile de Noirmoutier -	3 2	16	11½
ar, old Mole	2 20	3½		Port Navalo -	3 42	13	9½
ras -	1 49	4	2½	St. Nazaire -	3 10	15½	11
-	1 46	6	3½	Port le Palais, }	3 18	14½	10½
-	1 45	9½		Belle Ile - }			
-	1 24	12½	8	Port Louis, L'Orient -	3 11	11	9½
lina Rocks -	1 27	12½	8	Concarneau -	3 12	13	9½
na -	1 34	12½	8	Penmark Rocks -	3 16		
near -	1 53	12½	8	Glenan Is. -	3 12	13	10
na -	2 0	12½	8	Ile de Sein -	3 21	17½	12
-	1 18	11½	7½	Brest -	3 47	11	13½
-	2 7	13		Conquet Road -	3 46	21	15
-	2 30	8		Ushant -	11 11	19½	13½
l -	2 30	11	9	<i>South America, East Coast.</i>			
(Belem) -	2 30	11		<i>(Cape Horn to the Northward.)</i>			
-	1 54			St. Martin Cove, }	3 50	8	
go (Bar) -	2 30	7		Cape Horn Ids. }			
-	2 30	10					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Cape Peñas -	6 42	12		Port Belgrano -	6 0	12	1
Cape San Diego -	4 30	10		Tristan d'Aeunha -		6	
Orange Bay -	3 30	6		*Rio de la Plata, (C. } Castillos) }	6 30	2	
Goree Road -	4 0	8		" Buenos Ayres	12 0	3-5	
Le Maire Strait -	4 0	7		" Barragan Bay	7 0	5-9	
Staten Island -	4 30	8		Rio Grande do Sul		1½-2	
San Sebastian Bay	7 0			Santa Catharina L.	2 30	3	
<i>Falkland Islands, East Falkland.</i>				San Sebastian -	2 0	4	
Berkeley Sound -	5 0	7		Iha Grande -	12 30	5	4
Port William -	5 15	7	5½	Rio Janeiro -	3 0	4	3
Port FitzRoy -	4 45	6		Porto Erlo -	2 40	4½	
Port Pleasant -	5 0	6½		Macahé -	2 36	9½	
Island Harbour, } Choiseul Sound }	5 20	6		Benevente -	3 0	5	
Mare Harbour -	6 0	6		Espirito Santa }			
Darwin Harbour -	6 30	5½		Bay, and Port }	3 0	4	
Walker Creek -	6 20	5½		Victoria -			
Low Bay -	5 0	5½		Abrolhos -	4 48	6	
Adventure Sound	5 30	5½		Martin Vas Rocks	3 45		
Bay of Harbours -	6 0	5		Os Ilheos -	4 30		
Falkland Sound N }				Bahia -	3 30	8	
entrance }	6 45			Maceio -	4 30	8½	
" S. entrance	7 0			Pernambuco -	4 45	8	6
Ruggles Bay -	7 30	5		Parahayba -	5 0	9-12	
Port King -	7 30	5		Cape St. Roque -		8-10	
" Sussex -	8 15	6		As Rocas -	5 15	10	
" San Salvador	8 10	8		Fernando Noronha	4 0	6	
" San Carlos -	7 0	8		Aracati -	6 0	8	
<i>West Falkland.</i>				Jericoacoara -	11 30	12	6
Port Stephens -	7 45	7½		Maranhão -	7 0	17½	
" Albemarle -	7 15	7		San Joao -	6 24	14	
" Edgar -	7 15	6		Para -	12 0	11	10½
Fox Bay -	7 0	6		Cayenne River -	3 45	6-11	
Manybranch Harb.	7 40	7½		Maroni River -	5 30	8	
Port Egmont -	7 30	11		Surinam -	6 0	3½	
Hope Harbour -	8 10	7		Corentyn River -	5 10	8½	6
Shallow Harbour -	9 30	6		Berbice -	4 30	11½	6
Ship Harbour, New }				Demerara River -	4 45	9	6
Island - }	10 30			Orinoco R. (entr.)	6 0	3	
<i>South America, East Coast—continued.</i>				Chacachacare Id., }			
Coy Inlet -	9 30	40		Trinidad }	3 30	4	
Port Gallegos -	8 50	46		Dragons Mouth -	3 0	4	
Santa Cruz River -	9 30	40	29	Port Spain -	4 30	4	3
Port San Julian -	10 45	30		Tobago -	irr.	3½	
" Desire -	12 10	18½		Cartagena -	11 0	1½	1
" Melo -	3 40	15		Caledonia Harbour	11 40	1½	1
" Santa Elena -	4 0	17		<i>Caribbean Sea and the Bahamas.</i>			
Nuevo Gulf -	7 0	10		Barbados -	irr.	2	
Port San Josef -	10 0	30	25	Grenadines -	3 0	1½	1
Sea Bear Bay -	12 45	20		Grenada, (St. } George Harb.) }	2 40	1½	1
Port San Antonio -	10 40	28		English Harbour, }			
Rio Negro -	11 0	14		Antigua -		2	
San Blas -	2 0	12	10	Anegada -	9 0	1½	
Colorado River -	4 0	9	7½	Gorda Sound, }			
Union Bay -	3 10	12	9	Virgin Island - }			
				Tortola -		1½	
				Culebra or Pass- }	9 0	1	
				age Island - }			

* In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. w. and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Instæd, } Cruz - }	7 30	$\frac{3}{4}$		Colombilla Cay, }	2 0	2	
an, Porto } - - }	8 2	$1\frac{1}{2}$		Pearl Cays - }	10 30	2	
- - - }	6 45			Cape Gracias Harb. }	7 45	$3\frac{1}{2}$	
- - - }	8 0	$3\frac{1}{2}$	$2\frac{1}{2}$	Ruatan - }	irr.	2	
r-vos - }	9 30	3	$2\frac{1}{2}$	Serranilla Bank - }	irr.	2	
Cays - }	7 0	4		Serrana Bank - }	irr.	1	
l Island - }	7 0	$2\frac{1}{2}$		Old Providence - }	9 0	$1\frac{1}{2}$	
- - - }	7 20	$2\frac{1}{2}$		Bonacca Island - }	9 30	$1\frac{1}{2}$	
sland - }	7 45	$3\frac{1}{2}$		Mugeres Harbour - }	8 30	$1\frac{1}{2}$	
eHarbour, }	8 30	4	$3\frac{1}{2}$	Cozumel - - }	9 30	$1\frac{1}{2}$	
Island - }	8 0	3		Cape Catoche - - }	1 45	$2\frac{1}{2}$	2
s Reef - }	7 40	3		Campeche - - - }	2		
ay - - - }	7 40	3		Sisal - - - - }	noon	$1\frac{1}{2}$	
os Kay - }	7 40	3		Laguna de Terminos	noon	$1\frac{1}{2}$	
New Pro- }	7 30	4	3	Triangles - - - }	noon	$1\frac{1}{2}$	
ce - - - }	7 30	4		Arcas Rocks - - }	noon	$1\frac{1}{2}$	
ay „ - }	7 30	4		Vera Cruz - - - }	2		
y Anchorage	8 15	4	3	<i>United States.</i>			
r Sound - }	8 15	4	3	<i>(Texas, Louisiana, Mississippi, Florida, Georgia,</i>			
s Road - }	8 30	4	$2\frac{1}{2}$	<i>and S. & N. Carolina.)</i>			
- - - }	8 0	3		Brazos R. (entr.)*	irr.	$1\frac{1}{2}$	
War Cay - }	8 10	4		St. Luis Pass, Texas*		$1\frac{1}{2}$	$\frac{3}{4}$
y - - - }	8 30	3		Galveston - - - }		$1\frac{1}{2}$	$\frac{1}{4}$
y Rock - }	7 50	3		Sabine Pass* - }		$1\frac{1}{2}$	
ay - - - }	7 0	$4\frac{1}{2}$		Calcasieu River* - }		$2\frac{1}{2}$	$1\frac{1}{2}$
de la Plata, }	7 30	3?		Vermilion Bay }	irr.	$2\frac{1}{2}$	$1\frac{1}{2}$
omingo - }	7 0	4-5?		(entrance)* - }	irr.	2-2 $\frac{1}{2}$	
uille Bay - }	7 0	$5\frac{1}{2}$	$3\frac{1}{2}$	Atchafalaya Bay* - }	irr.	2	
auphin - }	6 0	3		Timballier Bay* - }	irr.		
Haïti, St. }	6 0	3		Barataria Bay }	irr.	$1\frac{1}{2}$	
ingo - }	6 0?	3?		(entrance)* - }	irr.	$1\frac{1}{2}$	
Harb. „ - }	8 0?	1?		Mississippi S.W. pass		$1\frac{1}{2}$	$\frac{3}{4}$
es Bay „ - }	8 0?	1?		Biloxi* - - - }	irr.	2	
St. Mark „ - }	8 0?	1?		Mobile - - - - }	irr.	1-2	
Prince „ - }	8 0?	1?		Pensacola - - - }		$1\frac{1}{2}$	
s „ - }	8 0?	1?		St. Andrews Bay*	irr.	1-2	
Aux Cayes „	uncertain	2-3?		St. Georges Sound }	irr.	$2\frac{1}{2}$ -4	
d Bay „ - }	„	2-3?		(west entrance)* }			
is Bay „ - }	„	2-3?		(middle entr.)* }	1 31	$1\frac{1}{2}$	$1\frac{1}{2}$
Bay „ - }	„	2-3?		Apalachicola Bay - }		$2\frac{1}{2}$ -4	
„ - - - }	„	2-3?		St. Marks* - - }	1 14	3	$2\frac{1}{2}$
„ Cuba - }		3		Cedar Cays* - - }	0 51	$3\frac{1}{2}$	$2\frac{1}{2}$
„ Antonio, }		$1\frac{1}{2}$		Tampa Bay* - - }	11 21	$1\frac{1}{2}$	$1\frac{1}{2}$
„ - - - }				Tortugas* - - - }	9 56	$1\frac{1}{2}$	1
Royal, Ja- }	11 0	1		Cay West* - - - }	9 30	$1\frac{1}{2}$	$1\frac{1}{2}$
„ - - - }				Cay West, N.W. }	9 10	$1\frac{1}{2}$	$1\frac{1}{2}$
<i>Bermudas.</i>				Channel* - - - }	8 40	2	1
Id. Dock }	7 14	4		Sand Cay* - - - }	8 23	$2\frac{1}{2}$	$1\frac{1}{2}$
- - - }				Indian Cay* - - }	8 34	$1\frac{1}{2}$	$1\frac{1}{2}$
<i>America, East Coast. (Isthmus of Panama</i>				Cape Florida* - }	8 21	5	4
<i>to the Northward.)</i>				St. Augustine* - }	7 28	$5\frac{1}{2}$	5
wn - - - }	9 0	$1\frac{1}{2}$		St. Johns River* - }	7 53	$6\frac{1}{2}$	$6\frac{1}{2}$
lds - - - }	1 50	2		Fort Clinch, Fer- }			
lands - - - }	1 45	2		nandina* - - - }	7 43	$8\frac{1}{2}$	$6\frac{1}{2}$
				St. Simons Island*	7 33	$7\frac{1}{2}$	7
				Doboy Lighthouse*	8 13	$7\frac{1}{2}$	$6\frac{1}{2}$
				Savannah (City)* - }			

the United States Coast Survey, the times of High Water being the Corrected and not the Vulgar Establishment.

Place.	High Water Full and Change.	Rise.		Place.	High Water Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Fort Pulaski, Savannah (entr.)*	7 20	8	7	Little Gull Island*	9 38	8	
Hilton Head*	7 19	7½	6½	New London*	9 28	8	
St. Helena Sound*	7 8	7½	6	New Haven*	11 16	6½	
North Edisto R.*	7 10	7	5½	Bridgeport*	11 11	8	
Charleston*	7 26	6	5	Sheffield Island*	10 58	8½	
Bulls Island Bay	7 16	5½	4½	Oyster Bay*	11 7	9½	
Georgetown*	8 40	4½	3½	Sands Point*	11 13	9	
— South Island*	7 56	4½	3½	New Rochelle*	11 22	8½	
Wilmington*	9 6	■	2½	Throgs Point*	11 20	9½	
Cape Fear River (Smithville)*	7 19	5½	4½	(New York to Portland.)			
Bald Head*	7 26	5	4½	Tarrytown*	9 57	4	
Beaufort*	7 26	3½	2½	New York*	8 13	5½	
Ocracoke Inlet*	7 4	2½	2	Sandy Hook*	7 29	5½	
Hatteras Inlet*	7 4	2½	2	Hell Gate Approaches*			
(Chesapeake Bay and Rivers.)				— Long Island (Blackwells Dk.)*	9 59	6	
Cape Henry	7 40	4		— N. of Astoria Ferry*	9 48	6½	
Cape Charles	7 45	5		— Pot Cove, (S.E. part)*	10 48	8½	
Old Point Comfort*	8 17	3	2½	— Wards Island (Paupers Dock)*	10 9	6½	
James R., City Point*	2 11	3	2½	Montank Point*	8 20	2½	
Richmond*	4 28	3½	2½	Block Island*	7 36	3½	
York R. (Moody's Wharf)	9 35	3½		Point Judith*	7 32	3½	
Piankatank River (Cherry Point)*	10 5	2	2	Newport*	7 45	4½	
Tappahannock*	0 42	2	1½	New Bedford, entrance*	7 57	4½	
Rappahannock (Saunders Wharf)	3 2	2½	2	Bird Island Light*	7 59	5½	
Point Lookout*	12 58	2	1½	Kettle Cove*	7 48	5	
Annapolis*	4 38	1	1	Cattyhook*	7 40	4½	
Chester R. (Rock-hall Creek)*	5 23	2½	1	Quicks Hole (S. Side)*	7 36	3½	
Patapsco River (Bodkin Point)*	5 42	1½	1	— (N. Side)*	7 31	4½	
Baltimore*	6 33	1½	1½	Menemsha Bight*	7 45	4	
(Delaware Bay and River.)				Woods Hole (entr. from Vineyard Sound)*	8 34	2	
Cape Henlopen	8 0	4½		— (entrance from Buzzard Bay)*	7 59	4½	
Delaware Breakwater*	8 0	4½	3½	Tarpaulin Cove*	8 4	2½	
Higbees, Cape May*	8 33	6½	5½	Gay Head	7 37	7	
Egg Island Light*	9 4	7	■	Holmes Hole*	11 43	1½	
Mahons River*	9 52	7	5½	Edgartown*	12 16	2½	
New Castle*	11 53	7	6½	Hyannis*	12 22	4	
Philadelphia*	1 18	6½	■	Nantucket*	12 24	3½	
(New Jersey.)				St. George Shoals	10 30	■	
Cape May Landing*	8 19	■	5	Monomoy*	11 58	5½	
Cold Spring Inlet*	7 32	5½	4½	Provincetown*	11 22	10½	
Little Egg Harbour	7 10	4½	3½	Wellfleet*	11 5	13½	
(Long Island Sound.)				Cape Cod	11 30	13	
Watch Hill*	9 0	3	2½	Barnstable	11 22	10	
Stonington*	9 7	3½	3	Plymouth*	11 19	11½	
				Boston Light*	11 12	11	
				Boston (Charlestown Naval Yd.)*	11 27	11½	
				Marblehead	11 30	■	

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		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
n*	11 13	10 $\frac{1}{4}$	8	St. John Harbour	11 21	27	23
cesterHarbour*	11 4	10 $\frac{3}{4}$	8 $\frac{3}{4}$	Quaco -	11 35	30	25
port* -	10 57	10 $\frac{1}{4}$	8	SpicersCove (near	11 35	37	30 $\frac{1}{2}$
squam* -	11 0	10 $\frac{3}{4}$	9	Cape Chignecto)			
ich* -	11 26	10 $\frac{1}{4}$	8 $\frac{1}{2}$	Grindstone Island -	11 47	41	34 $\frac{1}{2}$
buryport* -	11 22	9	7 $\frac{1}{2}$	Folly Point	11 49	45	38
mouth* -	11 23	10	8 $\frac{1}{2}$	(mouth of Petit-			
and* -	11 25	10	8 $\frac{3}{4}$	coudiac River -	11 55	45 $\frac{1}{4}$	38
iebec River	11 15	9 $\frac{1}{4}$	8	CumberlandBasin,			
anniwells				(Sackville -	12 15	47	37 $\frac{1}{2}$
int)* -				Monckton(Railway)			
at Desert Id. -	11 10	13					
<i>Bay of Fundy, Nova Scotia.</i>				<i>Nova Scotia.</i>			
Sable, Bar-	8 27	8 $\frac{1}{2}$	6 $\frac{1}{2}$	Negro Harbour -	8 12	7	5 $\frac{1}{2}$
gton Bay,				Shelburne -	8 4	7	5 $\frac{1}{2}$
lam Point) -	8 58	11	9	Rugged Island -	7 59	7 $\frac{1}{2}$	6
Sable, Clarkes				Port Mouton -	7 54	7 $\frac{1}{2}$	5 $\frac{1}{4}$
rbour -	9 25	12	10	Liverpool Bay -	7 50	8	5
ico -				Port Metway -	7 50	8	5
le, (Jones	9 27	12 $\frac{3}{4}$	10 $\frac{1}{2}$	Cape le Have	7 48	7	5 $\frac{1}{2}$
chorage) -				(Spectacle Id.)			
Island (Cape	9 49	12 $\frac{3}{4}$	10 $\frac{1}{4}$	Le Have, Crooked	7 51	7 $\frac{1}{4}$	6
ble) -				Channel			
woods An-	9 54	13	10 $\frac{1}{2}$	„ Mothers Island	7 51	7	5 $\frac{1}{4}$
orage -				„ Getsons Cove	7 55	7 $\frac{1}{4}$	6
gue -	10 4	15	11 $\frac{3}{4}$	„ Bridgewater,	8 6	8	6 $\frac{1}{2}$
outh -	10 9	16	13	McKean's Wharf			
y Cove E.,	10 33	21 $\frac{1}{2}$	17 $\frac{3}{4}$	„ Lunenburg	7 54	7 $\frac{1}{4}$	6
Marys Bay				(Spidlers Cove)			
Passage -	10 41	22	18	Sable Island, N. side	7 30	4	
l Passage -	10 43	20 $\frac{3}{4}$	17	„ S. side	6 30	4	
y Cove, West	10 47	23	19	Halifax Harbour -	7 49	6	5
y Gut -	11 0	27 $\frac{1}{2}$	23	Jedore Harbour -	7 45	6 $\frac{1}{2}$	4 $\frac{3}{4}$
George -	11 17	32	28	Ship Harbour -	7 54	6 $\frac{1}{2}$	4 $\frac{1}{2}$
laute -	11 21	33	28 $\frac{1}{2}$	Sheet Harbour -	8 6	6 $\frac{1}{2}$	4 $\frac{1}{2}$
Rock -	11 29	36	31	Liscomb Harbour -	8 0	6 $\frac{1}{2}$	4 $\frac{1}{2}$
ersAnchorage	11 42	39	33	Beaver Harbour	7 40	6 $\frac{1}{2}$	4 $\frac{1}{2}$
oro, Basin	12 17	43	37 $\frac{1}{2}$	Whitehaven -	8 0	6 $\frac{1}{2}$	4 $\frac{1}{2}$
of Mines				Canso Harbour -	7 48	6 $\frac{1}{2}$	4 $\frac{1}{2}$
n Bluff „ -	12 30	48	40	Crow Harbour -	8 0	6 $\frac{1}{2}$	4 $\frac{1}{2}$
„ -	12 41	50 $\frac{1}{2}$	43 $\frac{1}{2}$	Guysborough -	8 20	6 $\frac{1}{2}$	4 $\frac{1}{2}$
				Pomquet -	9 15	4	2 $\frac{1}{2}$
				Cape George -	9 15	4	2
				Merigomish -	10 6	5 $\frac{1}{4}$	3 $\frac{1}{4}$
				Pictou Harbour -	10 0	6	4
				Caribou Harbour -	10 0	6	4
				Amet Sound -	10 30	8	5
				Tatamagouche -	10 0	8	5
				Wallace Harbour -	10 30	8	5
				Pugwash Harbour	10 30	7	4
				Bay Verte -	10 0	9	5
<i>Bay of Fundy, New Brunswick.</i>				<i>New Brunswick.</i>			
love, Grand	10 54	20	15	Jourimain Island -	9 30	6	3
nan -				Shediac Harbour -	{ 1 0 }	4	2
as, Seal Is-	11 5	18	14 $\frac{3}{4}$		{ 8 0 }		
l -							
l Harbour,	11 7	21	17 $\frac{1}{2}$				
nd Manan -							
Quoddy -	11 12	21	17				
lead, Grand	11 16	22 $\frac{1}{2}$	18 $\frac{1}{2}$				
nan -							
au -	11 18	24 $\frac{1}{2}$	21				
ig Harbour -	11 19	23 $\frac{1}{2}$	20				
obello	11 21	23 $\frac{1}{2}$	20				
elchpool) -							

m the United States Coast Survey, the time of High Water being the Corrected and not the Vulgar Establishment.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Prince Edward Island.</i>							
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	
East Point -	8 30	3½	2	Anticosti Island } (East Cape) -	1 0	5	
Cardigan Bay -	8 40	5	3½	" Bear Bay -	1 10	5	
Cape Bear -	9 0	6	3	" West Point -	2 0	6	
Charlottetown -	10 45	9½	7	Cawee Islands -	1 50	9	
Crapaud -	10 0	8	6	Egg Island -	2 0	11	
Bedeque Harbour -	10 15	7	5	Point de Monts -	12 0	12	
Minimegash -	3 30	5	3	Cape Chatte -	12 0	13	
Egmont Bay -	3 0	4	2	Godbout River -	1 52	11	
Cascumpeque Hr. -	5 40	3	2	St. Nicholas Harb. -	1 55	12	
Richmond Harb. -	6 0	3	2	Manicouagon River -	2 15	12	
Cape Turner -	6 10	4	2	Bersimis River -	2 0	12	
Grand Rustico -	6 40	4	2	Bio Island -	2 15	14	
Tracadie -	7 0	3½	2	Port Neuf -	2 10	13	
St. Peter Harbour -	8 30	4	2½	Matan River -	2 15	11	
Boughton Harb. -	8 40	3	2½	Little Metis -	2 10	13	
				Saguenay, Tadousac -	2 45	17	1
				" Chicoutimi -	4 11	12	
<i>Cape Breton Island.</i>				<i>River St. Lawrence.</i>			
Port Hood -	9 0	4½	2	Green Island -	2 45	16	
Gut of Canso } (Plaster Cove) -	9 15	4	2	Brandy Pots -	3 0	17	1
Mabou River -	9 0	4		Coudres Island } (Prairie Bay) -	4 25	17	1
Cheticam -	8 15	3½		Pillars -	5 0	17	1
Cape North -	8 0	4		Crane Island, } Middle Traverse -	5 24	17	1
St. Anne Bay -	8 34	6	4½	Orleans Island, } North Traverse -	5 40	17	1
Sydney Harbour -	8 15	5	4	Quebec -	6 38	18	1
Meradon Bay -	8 15	5½		Carouge River -	7 15	16	1
Louisburg Harb. -	8 0	5	4	Frechette Island -	8 0	14	
St. Peter Bay -	7 30	6	4	Port Neuf -	8 30	14	
Habitants Harbour -	8 20	6½	4½	Gronoine -	9 0	9	
Arichat -	8 10	5	4	Cape Roche -	9 30	6	
Bear Head -	8 30	4½	3	Champlain -	9 45	3	
Poulament Bay, } Madame Island -	7 50	6	1	Batiscan -	9 48	3½	
Grande-digue, " -	7 55	6½	4½	Antigonish Harb. -	9 0	4	
				Three Rivers -	11 30	1	
<i>Labrador and Gulf St. Lawrence.</i>				<i>Gulf St. Lawrence.</i>			
St. Lewis Cape -	6 30			St. Paul Id. -	8 0	5	
Fall Harbour } (Telegraph Pt.) -	6 40	3½		Magdalen Islands -	8 20	3	
Chateau Bay -	7 35	3½	1	Gaspé Basin -	2 40	5	
Red Bay -	7 45	3½	1½	Point Macquereau -	2 0	5	
Bradore Bay -	8 45	4	2	Carleton Point -	3 0	6	
Belles Amour Bay -	9 0	4½	2½	Dalhousie Harb. -	3 10	2	
Bonne Esperance } Harb. -	9 15	5	2½	Campbell Town, } Ristegouche R. -	4 0	10	
Mistanoque -	10 30	6	3	Bathurst -	3 15	7	
Antrobus Island -	10 30	5	3	Shippigan -	3 42	5½	
Wapitagan Harbour -	10 30	5	3	Carquette Harbour -	2 40	6	
Coacocho Bay -	10 30	5	3	Miscou -	2 30	5	
Kegashka Bay -	10 45	5	3	Miramichi Bar -	5 30	5	
Little Natashquan -	11 0	5	3	Sheldrake Island -	6 0	3	
Appetetat Bay -	11 10	5?	3?	Vin Harbour -	5 45	3	
Betcheween Har- } bour -	11 32	5	3	Beaubère Island -	6 30	6	
Clearwater Point -	11 30	5	3	Point Escumeneac -	4 10	4	
Mingan Harbour -	1 16	6	4	Richibucto River -	3 30	4	
Mingan Island -	1 30	6	4	Buctouche River -	7 0?	4?	
Bay of Seven Is- } lands -	1 40	9	5	Cocagne River -	7 30?	4?	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Newfoundland.				Barrow Strait.			
	h. m.	ft.	ft.		h. m.	ft.	ft.
re - -	8 33	6½	4½	Port Leopold -	12 6	6	4½
n Harbour -	9 15	8½		Erebus Bay -	12 6	8	
and Little } -	8 15	7	4	Griffith Island -	12 15	3¾	2¾
St. Law- } -	8 30	7	4	Melville Island.			
e Harbour } -	8 45	6½	4½	Winter Harbour -	1 30		
y Harbour -	7 40	7½	5	Banks Land.			
Harbour -	8 0	7½	5	Bay of Mercy -		2	
t. Mary -	8 30	7	5	Prince of Wales } -		3	
ia - -	8 30	7	5	Straits - -			
ey Harbour	7 0	6½	5	Africa, South Coast.			
ns - -	7 30	6	4	Simons Bay -	2 44	5½	3¾
r Grace -	7 30?	7?		Dyer Island -	2 50	5	
, Trinity Bay	7 22	3½	2	Cape Agulhas -	2 50	5	
a Harbour	7 0	6	4	Mossel Bay -	3 30	6	
Harbour -	7 10?	5?		Nysna Harbour -	3 45	5	
land -	7 20	4		Plettenberg Bay -	3 10	6	
land -	7 0?	2-3?		Flesh Bay or Bay } -	3 30?	6?	
Harbour -	7 0?	2-4?		St. Bras - -			
l Harbour -	7 0?	2-4?		Algoa Bay -	4 0	4-5	
e Lis Harb.	7 15	2-4		Bird Islands -	4 0	4-5	
Harbour -	7 0?	2-4?		Waterloo Bay -	4 0	6	
arbour -	6 30?	4?		Buffalo River (en-	3 45	4½	
en Harbour {	7 21 A.M.	4½	3	trance) - -			
Cove -	6 30 P.M.			St. John River -	4 0	5	
Harbour -	7 0?	2-3?		Port Natal -	4 30	6	
e Bay -	7 0?	2-3?		Delagoa Bay, Eng-			
t Bays -	7 0?	2-3?		lish River (Por-	5 20	12	
B., (N. Cst.)	7 23	2½		tuguese Factory) }	4 30	15	
arb. (N.Cst.)	7 25	3?		" (Port Melville)	4 40	12	
-Choix, } -	10 47	5		" Shefeen Island			
V. Coast) -				Africa, East Coast.			
ort, Bay of }	10 42	5½		Inhambane River -	4 15	10	
ds - -				Cape Bazaruto -	4 15	10	
Island -	9 15	6	4	Sofala River -	4 0	19	
isque -	8 55	5½	3½	Quilimane River }	4 15	16	
e Bay -	9 0	6	4	(entrance) -			
Hudson Strait.				Zambezi River }	4 30	12-15	
Islands -	6 50			(Pearl Island) }			
nd Hecla } -				Luabo River (en-			
t, Melville }	7 0	8		trance) -		22	
insula -				Angoxa River -		13	
Hudson Bay.				Mozambique Har-	4 15	12	
actory -	11 15	10-14		bour - -			
Arctic Regions, Greenland, West Coast.				Pomba Bay -	4 0	15	11
haab -	5 6	7	5	Oibo Harbour -	4 15	6	
ckshaab -	6 3	12½	9½	Mahato Island -	4 30	7	
aborg -	6 30	10		Cape Delgado -	4 0	16	11½
rik -	11 0	8		Rovuma River -	4 0	16	11½
holm }				Lindy River (en-	4 15	12	
d - -	11 8	7½		trance) - -			
				Mungullo or }	4 45	12	
				Mongallo River }			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.
		Springs.	Neaps.			Springs.
	h. m.	ft.	ft.			
Quiloa - -	4 45	12				
Latham Island -	4 0	10				
Zanzibar (Channel)	4 15	11				
Zanzibar - -	4 20	10				
Pemba Channel -	4 0	11				
Port Cockburn, } Pemba Id. - }	4 15	12				
Melinda - -	4 0	11				
Mombaza - -	4 15	11				
Lamo Harbour -	4 6	11				
Patta Bay - -	4 30	10				
Port Durnford -	4 45	12				
Brava - -	4 30	8				
Magadoxa - -	4 30	8				
Rás Haffún - -	6 15	4				
Bander Alúleh -	6 45	6				
Bander Gorí - -	8 45					
Berbereh or } Burburra (Gulf } of Aden) - }	7 15	9				
Zeyla - -	7 15	8½				
Ghubbet Ne. Socotra	7 0	7				
Gollonsir - -	7 20	8				
Bander Sháab -	7 0	7				
Abd-al-Kuri - -	8 30	6				
Kal Farun - -	8 20	6				
<i>Madagascar, East Coast.</i>						
British Sound -	4 0	9½				
Port Leven - -	3 30	7½				
Andrava Bay - -	3 30	7				
Antongil Bay } (Port Choiseul) }	4 0	5				
Tangtang Harbour	4 30	6				
Madame Island, St. }	4 0	5				
Mary Harbour }						
Tamatave - -	4 18	8				
Fort Dauphin -	4 30	7				
<i>Madagascar, West Coast.</i>						
St. Augustine Bay	4 30	13				
Noss or Sandy Id.	5 0	15				
Cape St. Vincent -	4 45	12				
Mourondava - -	4 45	12				
Barren Islands -	4 45	12				
Boteler River - -	4 30?	15?				
Boyanna Bay - -	4 30	15				
Makumba River -	4 45	17				
Bembatooka Bay -	4 30	16				
Majambo Bay - -	4 30	16				
Narrinda Bay - -	4 30	15				
Port Mazambo - -	4 30	15				
Port Radama - -	4 40	13				
Passandava Bay -	5 0	15				
Dalrymple Bay - -	5 0	15				
Minow Islands -	5 0	15				
St. Juan de Nova -		5				
				<i>Red Sea.</i>		
	h. m.	ft.				
Bab-el-Mandeb St.	12 0	7				
Mocha Road (East } Coast) - }	12 0	4½				
Murdounah Island } (East Coast) - }	6 0	3				
Ushruffi Islands -	6 14	2				
Massowah - -	1 0	3				
Omaider Island } (Gulf of Akabah) }	6 0	4				
Rás Mahommed } (Gulf of Akabah) }	6 0	5				
Jiddah - -		3				
Sale Macowa - -	0 30	2				
Loheia - -	1 30	3				
Suez Bay (head of } Gulf) - }	2 0	6				
				<i>Arabia, S.E. Coast.</i>		
Bab-el-Mandeb } Strt. (Perim Id.) }	12 0	7				
Bander Feikam -	10 0	8½				
Aden & adjacent } Bays - - }	7 30 to } 9 30	7				
Sughrá - -	8 0	6				
Makátein - -	9 0	6				
Rás-al-'Asidah -	8 30	5½				
Makalleh - -	8 30	7				
Rás Sharmah - -	9 0	8				
Merbát - -	9 0	6¾				
Kuriyán Muriyán } Bay & Islands }	8 20	6½				
Cape Isolette - -	9 0	10				
Sháb Kadún - -	9 20	10				
Jezírat Hamar-al- } nafur - }	9 30	10				
Sháb-'bu-saifeh -	9 45	10				
Ghubbet Hashish -	10 0	10				
'Om-rasas-Masírah	10 0	10				
Rás Shébali - -	10 0	10				
Rás-al-Hed - -	9 30	9				
Khór Jerameh - -	9 30	10				
				<i>Persian Gulf.*</i>		
Maskat - -	11 15	6				
Jezírat Jún - -	11 30	10				
Rás al Kheī meh -	11 45	7				
Al Bida' - -	8 30?	6?				
Bahreīn - -	5 30	7				
Jezírat Arabī - -	6 30?					
Jezírat Kabr - -		8½				
Koweit - -	0 15	9				
Basrah (Bar) - -	12 0					
Jezírat Kharg or } Kháreg - - }	8 0	6½				
Abú-shehr - -	7 30	7				

* Deduced from observations made in the E.I.C. brig Euphrates 1857-58, and H.M. schooner the Indian Navy, 1858-60, by Commander G. C. Constable and Lieutenant A. W. Stiffe Indian Navy.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Nakhe-	7 30?	8?		Calicut Roads -	0 15	5	
-	5 0?			Beypoor River (en-	0 15	5	
-	0 45	7½		trance) -			
ais -		8		Cochin Harbour	1 0	3½	
umb -	12 0?			and Road -			
-	12 0	10					
-	11 0	12					
árek -	10 15			<i>Ceylon, South Coast.</i>			
own -	6 0?	9		Colombo -	1 0	2	
Shoal, }	9 30	8		Dodandowe Bay -	1 50	1½	
histan - }				Pointe de Galle -	2 0	2	
				Belligam or Red Bay	2 20	2½	
				Kirindi -	3 30		
				Batticalao River -	5 0	2-3	
				Trincomalie Har-	8 18	2	1½
				bour -			
				Palmeira Point -	9 30	7-11	
<i>Hindoostan, West Coast.</i>				<i>Bay of Bengal, West Coast.</i>			
oint (en-	10 50	9½	6	Tuticorin Har-			
Karachi }				bour and Road, }	1 15	2½	1½
Bunder }	9 50	7		(Gulf of Manar) }			
of Indus) }	10 5	9		Keelacarry -	11 0		
" -	10 10	8		Paumben Pass -	1 30	2	
" -	9 57	9		Kimapatnam (West			
y " -	10 30	11		side of Palk }	11 0	1½	
iver (en-				Strait) -			
-	11 40	11		Negapatam -	5 0	3	
er (Mon-				Nagore -	8 15		
t) -	12 20	12	8	Madras Road -	7 34	3½	
of Catch) }	2 0	16	12½	Pulicat Shoals -	8 25	2½	
" Creek }	11 0	9		False Point -	8 0		
se) -				Point Divy -		5	
Roads -	11 50	15	11	Coringa or Coca-	9 10	4-5	3
-	11 35	9	7½	nada Bay }			
nterance, }	2 15	18	13½	" River (Bar) }	9 0		
ambay) }				Balasore River -	10 0	15	
-	2 0			Kedgerie -	11 30		
-	4 0	19		Saugor Island -		12	
Bar) -	1 30	17		Western light ves-			
-	0 15			sel (entrance to }	10 0	10½	
River, }	3 0	18		Hoogly) -			
-				Mutlah River, }			
River }	2 0	19		Western or }	9 0	10	
se) -				Ward's Channel }			
. (entr.) }	1 45	18		" (entrance to }	10 0	14	
River " }	1 45	18		Biddah River) }			
ver " }	1 30	17		" (Muda Kali) }	11 45	15	
River " }	1 30	16		Calcutta -	2 30		
Dockyard }	11 40	12-17					
Harbour }	11 0			<i>Bay of Bengal, East Coast.</i>			
River }		12		Hastings Harbour }			
se) -	2 0			(Mergui Archi-	10 40	13½	
rbour -	2 40	9		pelago) -			
nk -	10 30	9		Mergui -	10 30	18	
Harbour -	11 25			Tavoy River, (en-	10 30	20	
-	11 30	6		trance) }			
r Bay* -	10 0			Maulmain " -	2 0	22	17
int -	10 30	9		Martaban -	2 20	21	
ver -	11 0	7					

ides rise, a.m. 6 feet, p.m. 7½ feet from October to March; and the contrary during the rest

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	N
	h. m.	ft.	ft.		h. m.	ft.	
Rangoon R. (entrance)	3 15	21	14	Laccadives, Cher- baniani Reef - }	10 0	7	
Rangoon -	5 30	21	14	Tamareed, Socotra	7 20	8	
Bassein River } (entrance) - }	10 0	9	6	Keeling Islands } (Port Refuge) - }	5 30	5	
Ramree Road -	10 0	12		Christmas Id. -	10 0		
Kijouk Phyou } Harbour - }	10 0	9	6	Nicobar Islands, } Nancowry Har- } bour - }	9 15	8½	
Akyab, Aracan } River (Bar) - }	9 45	9	6	Andaman Islands, } Port Blair } " Port Corn- } wallis - }	10 0	9	
Naafe River (en- } trance) - }	10 0			" Andaman } Strait }	10 24	9½	
Cheduba Island -	11 30	8					
Diamond Island -	10 30	8					
Chittagong (Bar) -	1 15	15	10				
<i>Islands in Indian Ocean.</i>				<i>Malacca Strait, Malay Coast.</i>			
Kerguelen (Christ- mas Harbour) - }	2 0	2		Junkseylon Island } (East side) - }	10 0	11½	
St. Paul Island -	11 0	3		Queda -	12 0	5½	
Amsterdam Id. -	11 0	3		Penang (George- town) - }	12 0	9	
Mauritius, Port } Louis - }	12 30	3	2½	Lt. Vessel (One } Fathom Bank) }	6 0	15	
" Grand } Port - }	1 0	1½		Arroa -		10	
Reunion or Bour- bon Island, }	Noon	3½		Cape Rachada -	5 30	13	
(St. Pierre) }				Sambilangs -		12	
" (St. Denis) -	0 22	2½		Malacca Road -	7 30	11	
" (St. Gilles) -	1 0	2½		Off Mount Formosa	8 0	11	
" (St. Paul) -	1 7	4		Tanjong Bolus -	9 30	10½	
Rodrigue Island -	1 45	6		North Sands -	5 30	15	
Cargados Garayos } Shoals - }	2 0	4		Singapore, New } Harbour - }	9 45	10	
Chagos Archipel- ago, (Diego } Garcia) - }	1 30	6		Rhio -	10 0	7	
Seychelle Archi- pelago, (Mayhé } Island) - }	4 0	6½		<i>Malacca Strait, Sumatra Coast.</i>			
Curieuse Island -	5 10	7		Diamond Point -	12 0	9½	
Peros Banhos -	1 30	5		Siak River (en- trance) - }	9 0	12	
Amirauté Isles, } (St. Joseph I.) }	5 0	8½		" off the town -		11	
Comoro Islands, } (Johanna Island) }	3 30	8½		<i>Timor, East End.</i>			
Comoro Islands, } (Mayotta Is- } land, N.W. end) }	4 10	11½		Koepang - -	11 0	9	
Maldives, Adou } Atoll }	1 0	4		<i>Sumba or Sandelhout, North Coast.</i>			
" Suadiva } Atoll. }	1 0	4		Nangamessie Har- } bour - }	11 30	17	
Maldives, Adou } Matte Atoll }	3 0	4		Palmedo Road -		15	
" Malè	12 30	3		<i>Sumbawa.</i>			
" Malcolm } Atoll }	10 30	3		Ragged Island -	8 10	3	
" Heawandou } Pholo Atoll }	9 30	5		Sapie Bay -	1 0	10	
				Britannia Bay -	1 0	11-12	
				Bima Bay -	Noon	6	

Place.	High Water, Full and Change,	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Lombok, West Coast.</i>				<i>Java Sea.</i>			
am Bay -	h. m. 8 0	ft. 6	ft.	Crimon Islands -	h. m. 8 0	ft. 6	ft. 5
Bay -		10-12		<i>Celebes.</i>			
<i>Baly.</i>				Macassar -	4 40	5½	
Bay -	11 0	9½		<i>Flores Sea.</i>			
h Coast) -				Adenara, Flores -		8	
os Road -	5 0	6½		<i>Moluccas.</i>			
h Coast) -				Batchian, Gilolo -	1 0	8	
<i>Java.</i>				Sanguir Island -		6	
ng Bay -		7-8		Gèby, Fohou Island -		5	
p Harb. -	8 45	3½		Wahaaay Harbour, } Ceram - }	6 0	3	
h Coast) -				Bouro, Cajeli Bay -	1 0	6	
ops Bay -	5 0	5½	4	Amboyna -	0 32	7	
. Coast) -				Saparocaa Island -		6	
-		5		Cambing or Pas -	noon	6	
-	10 0	2		sage Island -		6?	
-	7 0	4		Banda, Banda Islands -	4 0	6?	
<i>Sumatra, N.E. Coast.</i>				Dampier Strait -		11	
or -		5		<i>Filipinas.</i>			
be -	6 0	6		Port Zebu -	12 0	7	
ld., Linga -	6 0 p.m.	12		Port Buluagan -	12 0	5½	
-				O'sta Ana -	12 0	5½	
river -	4 0	8		Port Iliolo -	12 0	6	
<i>Sumatra, West Coast.</i>				Port San Jacinto, } Ticao Island - }	6 30	6	
en -	6 0	3-5		Mindanao -	7 0	8	
River (Bar) -	6 0	4½		Manila (Luzon) -	10 40	2½	
ur Island -	6 0	4		Port Sual -		6	
end) -				Port Laguimanoc -	1 30	5½	
poly Har- -	6 10	6		Alabat Harbour -	10 0	9	
-				Paloan Bay (Min- } doro) - }		5	
Head -	8 45	8		Busuanga (Burias Id.) -	12 30	6	
<i>Durian Strait.</i>				<i>Loo Choo Islands.</i>			
eland -		10		Nafa-Kiang -	6 28	7	
int -	5 0	10		Port Oonting -	6 35	8	
nd -	5 0	10½		<i>Bonin Islands.</i>			
<i>Banka Strait.</i>				Port Lloyd -	6 8	3	
Ali Point -	8 30 p.m. * 10 0 a.m. †	12		New Port, Hilla- } borough Id. - }	11 32	3½	
a Pass -	irr.	10	7½	<i>China Sea, East Coast.</i>			
Island -	7 0	9½		Rendezvous Island, } Borneo, S.W. }		8	
lar -	6 30	12		Coast -		7	
Point -	6 30	12		Tanjong Api -			
Point -	8 17†	12½		Sarawak River -			
Point -	11 0*	10		(Moratabas en- } trance) - }	4 0	9	5½
<i>Gaspar Strait.</i>							
endanao -	2 30	4					
at -	2 30	4					

* In S.E. Monsoon.

† In N.W. Monsoon.

all observations made in the month of September by W. Stanton, Master commanding H.M. Surveying Brig, *Saracen*.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Sarawak River, } " Santubong } " Sarawak } " Junction } " " City }	4 0 5 0 5 20	10 15-18 15-18	6 9 9	<i>Babuyan Islands.</i>			
Burong Island -	4 45	7		Port Pio Quinto, } Camiguin Island }	6 0	6	
Rajang River -	4 45	13	9	Port Musa, Fuga } or New Babuyan }		5	
Bruit River -	3 0	11		<i>China Sea, West Coast.</i>			
Bintula River -	5 45	6		Romania Point, } (Malay Penin- }	10 30		
Labuan Island -	9 45	6		sula, E. Coast) }			
Mangalaum Island	11 0	5		Sedili River (en- }	9 44	7	
Bruni River -	11 0	12		trance) " }	8 50	9	
Dalawan Bay }	11 0	5		Blair Harbour " }	6 0	7½	
(Balabac Is- }				Pulo Timooan (West }			
land) - }				side) - }			
Malludu Bay, }	10 30	6-8		Binkang Bay (Co- }	11 30	5	
Borneo N. Coast }	10 0	6-8?		chin China) - }			
Balambangan Id. -		7		Tringano River }	8 0	7	
Ragged Point, }				(Gulf of Siam, }			
Borneo, E. Coast }		8-10		West Coast) - }			
Famarung Islands }				Menam River, }	5 7	9½	
(Borneo East }				Paknam " }	5 7	11	
Coast) - }				Cape Liant (Gulf }			
Eran Bay (Pala- }	10 10	6½		of Siam, E. Coast) }			
wan, West }				Chentaban River }	10 0	5½	
Coast) - }				(entrance) " }			
Tay-bay-co-bay }	10 15	6		Rocky Island (Gulf }	4 0	4	
" "	9 30	5½		of Siam, E. Coast) }			
Ooloogan Bay " }	9 55	3½		Pulo Panjang }	7 0	3	
Mayday Bay " }	10 55	6		Pulo Condore }	2 30	6½	
Port Barton }	9 40	6		(Cochin China)* }			
(Bubon Point) " }	10 0	6		Saigon, Cochin }	11 0	8	
Pancol " "	9 30	5½		China, Cape St. }			
Bacuit Bay " "	11 0	5½		James - }	5 30	9½	
Cavern Island " }				" Saigon City }	8 30	5½	
Observatory }				Nhatrang Bay }			
Island - }				(Cochin China, }	11 30	5	
Ursula Island }	11 0	7½		E. Coast - }	3 0	4	
(Palawan, East }				Hon-cohe Bay " }			
Coast) - }				Taron Bay " }			
Port Royalist -	11 0?	6½?		Galang Bay }		4-5	
Millman Island }	10 27	2½		Hainan Island, }			
(Palawan, West }				Tien-pak Harbour }	12 0	8½	
Coast) - }				(China, E. Coast) }			
Casuarina Point, "	9 30	6½		Pratas Shoal -	4 0	5	
Barren Island "	9 30	5½		Canton River }	10 0	8	
Bird Island "	9 30	6		(entrance) - }			
Tai-Tai Bay -	9 30	5½		Broadway River }	11 0	7½	
Batanes, Bashee }		4		(entrance) - }			
Islands - }				Tupa Anchorage -	10 0	7	
Port Kok-si-kon }	11 30	3		Macao -	10 0	6½	
(Formosa, East }				Cumsingmun Har- }	12 6	6½	
Coast) - }				bour, Canton R. }			
Tam-Sui Harbour }	11 45	7-12		Junk Fleet entr. " }	11 50	6½	
" "				Tailung Channel " }	1 30	6½	
Kelung Harbour }	10 30	3		Lankeet Id. " }	11 20	6½	
(Formosa, N. }				Lintin Id. " }	12 0	7½	
Coast) - }				Fan-si-ak Channel, "	1 0	7½	

* From a French Survey, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full, and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Point River -	2 0	7½		Towan Island -	9 30	13	
Mar. -	1 40			Tai-chow Islands -	9 0	14	
April -	1 15	7-8		St. George Id. }	10 20	15	
May & June -	0 30			San-moon Bay }	9 30	14	
Mar. -	2 40	5½		Kweshan Islands -	10 30	20	
May & June -	1 40	5½		Nimrod Sound -	9 40	14	
SiKiang River. }		5-6		Vernon Channel, }	11 0	12	9
" -		3		Chusan Archipelago -	8 15	12	
" -		1-1½		Ting-hae Harbour -	10 0	13	
g Road-roup -	10 15	4½		Poo-too Island -	11 30	15	
Mirs Bay -	10 0	5		East Saddle Island -	11 0	14	
Id. Bias -	8 0	6½		Yung River, Chin-hae -	11 20	12½	
" Id. -	8 30			" Ning-po-fu -	1 0	9	
Bay -	10 0	6½		Hang-chu Bay, Sesham Ida. -	11 45	14	
Point, in Bay -	7 0			" Fog Islands -	11 45	17	
nt -	8 0			" Chapu Road -	12 0	25	
lay -	9 0	7?		Hang-chu Bay (off Can-po) -		32	
od Hope -	9 0	7?		Gutzlaff Island -	11 30	15	
nd, Na- }	11 15	7		Yang-tse Kiang (entrance) -	12 0	15	10
ly -	11 0	6½		" entrance to Wusung River -	0 30	15	10½
Harbour -	11 30	12		Pheasant Point, Wusung River -	0 35	13	8
d. Rees -	11 30	12		Shanghai -	0 40	10	7
harbour (res) -	10 30	9½	7	†Langshan Crossing -	1 40		8
er Harb. -	12 0	16		<i>Yellow Sea.</i>			
ay -	12 15			Lo-ahan-kau -	4 30	11	9
ay -	10 20	16		Staunton Island -	1 30		
arbour -	12 25	17		Shihtau Bay -	1 30		
und -	12 30	17		Aylen Bay -	2 40		
trait -	12 15?	16?		Wei-hai-wei Harbour -	9 30	9	
Ida. -	9 0			Lung-mun Harbour -	10 0	7	
, Tem- }	10 45	19	14½	Chifu -	10 0	8	6½
r, Lo-nd -	12 0			Miau-tau (Depôt Bay) -	10 35	8	
Island -	9 30	17		Peiho or Peking River (entr.)† -	3 10	10	
nd -	10 0	17		Tien-tsin, Peiho River -		4½	
r -	10 15	18		Sand Point, Gulf of Liau-tung) -	4 50	7	5½
Harbour -	10 0	17		N.W. Head of Gulf of Liau-tung -	5 30	10	8½
nds -	8 30	17					
1 Ida. -	8 30	17					
ig- }							
3ullock -	8 30	17					
iver(entr.) -	9 0	15½					
City -	9 30	15½					

upon Docks—In March, the day and night tides rise to the same level. From April to October the tides are the higher, and from November to February the lower. In May and June the level, the tides is 4 feet, and the neaps 2 feet higher than in March. Langshan Crossing the tide rises for 3 hours only, and falls for 9 hours.—H.M.S. Acton, 1861. rise much affected by winds.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	N
	h. m.	ft.	ft.				
Liau Ho (Bar) -	4 0	11		<i>Gulf of Tartary.</i>			
" (entrance)	5 0	12			h. m.	ft.	ft.
Vansittarts Saddle	4 20	10	8½	St. Vladimir Bay	irr.	2	
Huluashan Bay -	2 30	8		Napoleon Road	2 30	2½	
Port Adams, Suli-	0 15	8		(West Coast) -			
van Bay -				Port Michael Sey-	5 30	3	
" Mary	2 0	10		mour			
" Island -				Barracouta Har-	10 0	3½	
Pigeon Bay -	11 45	8		bour			
Ta-lien-whan Bay	10 10	12	8	Castries Bay	10 30	6	
Encounter Rock -	10 30	10		Jonquiere Bay	10 0	6	
Haiyun - tau	9 0	12		(East Coast) -			
(Thornton Haven)				Amur Strait -	11 40	5-6	
Chodo Id., Korea,	6 20	12					
W.C.				<i>Kamchatka.</i>			
Basil Bay	4 15	18	10	Avatcha Bay -	3 30	6½	
Marjoribanks	3 30	29					
Harbour				<i>New Zealand:—South or Stewart Island.</i>			
Ko-kun-to Group	2 25	18	10	Mason Bay -	11 10	8	
Port Hamilton,	8 30	11		S.W. Cape -	12 0	7	
(Korea, S.C.) -				Port Pegasus -	11 50	■	
<i>Japan Sea.</i>				Port Adventure -	12 20	8	
Yung-hing Bay -	5 20	2½		Patersons Inlet -	1 10	8	
Tsau-liang-hai or				Port William -	12 45	8	
Chosau Harbour	7 45	7	5				
(Korea) -				<i>Middle Island, East and North Coasts.</i>			
Nagasaki Bay	7 15	9	7½	Bluff Harbour -	1 18	8	
(Nipon, S. C.) -				Molyneux Bay -	3 0	8	
Tsu sima Sound -	8 30	8		Otago Harbour			
Simonoseki -	8 30	8	6	(entrance) -	2 50	7	
Sado (Yebisu) -	5 0	2		Akaroa Harbour -	3 24	8	
Tengur Strait -	5 0	5		Port Cooper -	3 50	7½	
Hakodadi Har-	5 0	3		Kaikora Peninsula	5 30	8	
bour, Yezo Id.				Cape Campbell -	6 0	8	
Endermo Har-	5 30	6		Port Underwood -	6 10	8	
bour, Yezo Id.				Queen Charlotte			
La Perouse Strait	10 30	6		Sound (entrance)	8 50	8	
Yoku-hama, Yedo	6 0	6½	4½	Port Gore -	9 0	■	
Bay -				Pelorus Sound			
Tatsumi Bay -	5 50	5		(entrance) -	9 35	11	
Fataisio -	6 0	5		Port Hardy -	9 55	■	
Port Simoda -	5 0	3-5		Croisilles Harbour	9 0	12	
Heda Bay -		5½		Nelson -	9 50	14	
Enora Bay -		4		Massacre Bay.	8 45	13	
Simidsu -	7 30	7		Tasman Corner			
Urakami -	7 30	6	5	—Motu Pipi	9 50	1■	
Oösima -	6 50	5		River, W. Est.			
Tanabé Ki Chan-	6 0	6	5½	Cape Farewell -	9 20	14	
nel -							
Uranouchi -		5		<i>Middle Island, South and West Coasts.</i>			
Osaki -	5 55	6½		Ruapuke Id. (Fo-	1 0	■	
Kata -	6 4	6½		veaux St.) -			
Yura Harbour -	6 5	6½		Centre Id. (Fo-	12 15	8	
Naruto (Fukura) -	6 17	7		veaux St.) -			
Akasi -	6 36	6½?		Preservation Inlet	11 20	8	
Awajima (Inland	0 14	7		Chalky Inlet -	11 8	8	
Sea) -							
Tomo (Seto-uchi)	11 0?		5				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
ay -	11 15	10	8	Jervis Bay -	6 20	6 - 9	
und -	11 30	8	6	Port Jackson, } North Head -	8 15		
n Sound -	11 30	8	6	Sydney -	8 38	4 1/2	4
nd -	10 45	8	6	Broken Bay -	8 0	6 - 9	
ound -	9 15	8	6	Newcastle or Port } Hunter -	9 45	6 - 7	
i Inlet -	11 20	7	6	Port Stephen -	9 0	6	
<i>South Island, South and West Coasts.</i>				Manning River -	10 0		
olson, } Harbour -	4 30	5	3	Port Macquarie -	8 56	4 - 5	
und -	7 0	8	6	Shoal Bay -	8 30		
and -	9 0	6		Richmond River -	9 20		
a River -	10 0	8	6	Cape Byron -	9 45	6	
i River -	10 15	8	6	Tweed River } (Danger Point) -	9 45	5 - 8	
mouth } -	9 30	12	9	Moreton Bay -	9 30	3 - 7	
aki) -	9 30	12		Wide Bay -	9 0	6 - 8	
Iarbour -	9 30	12		Sandy Cape -	7 50	6 - 8	
rbour -	10 0	12		Port Curtis -	9 40	10 - 12	
River -	9 30	12	9	Byron Bay -	9 45	6	
Harbour } -	9 30	13	10	Wreck Reef, } (Bird Islet) -	8 3	6	
ce) -	10 55	10	8	Cato Bank -	8 0	6	
Harbour } -	9 45	0		Lady Elliot Islet, -	9 0	7 - 8	
ce) -	10 15	10	7	Heron Islet, } -	9 0	10	
River } -	8 0	7		Capricorn Group } -	9 30	9 - 14	
okohu) -	8 0	7		Keppel Bay -	8 48	7	
ria Van } -	8 0	7		Great Barrier Reef -	8 0	6	
mgs Is -	8 0	7		Saumarez Reef -	8 0	5 1/2	
				Frederick Reef -	8 0	5	
				Kenn Reef -	8 30	5	
<i>North Island, East Coast.</i>				Middle Bellona Reef -	8 30	5	
iser -	6 0	6		Avon Isles -	8 30	5	
ay -	7 50	3		Chesterfield Islet -	8 30	5	
3ay -	6 5	6		Mellish Reef (Sand } -	7 55	5 - 6	
-	8 55	7		Cay) -			
y -	9 0	7		Thirsty Sound -	10 45	12 - 18	
Harbour -	7 10	6	4 1/2	Port Bowen -	9 35	16	
Bay -	7 21	7	5	Shoal Water Bay -	10 30	12 - 18	
er Island } -	6 25	III	7	Broad Sound -	11 0	20 - 30	
Cove) -	7 5	11	9	Swain Reefs -	10 25	10	
Harbour -	6 30	10	7	Percy Isles, Middle } -	10 30	16	13
land -	7 0	9	7	or No. 2 Island } (West Bay) -			
Harbour -	7 0	9	7	" South or } -	10 30	14	
Harbour -	7 10	9	7	No. 1 Islet, } (N.W. Bay) -	10 20	14	
u Harbour } -	7 15	9	6	West Hill -	11 0	14	
Islands, } -	8 15	7		Cape Conway -	6 45	6	
ea Islet) } -	8 15	9	7	Goold Island -	9 30	6	
Harbour -	7 44	7		Port Denison -	9 0	6	
lands -	7 54	7		Upstart Bay -	7 30	10 - 12	
Harbour -				Cleveland Bay -	9 28	6 - 10	
iver -				Dunk Island -	9 15	7 - 12	
enga } -				Fitz-Roy Island -	8 0	5 - 10	
r -				Endeavour River -	9 15	7 - 12	
<i>Australia, East Coast.</i>				Trinity Opening, } -			
3ay -	10 0	7	5	Great Barrier } -			
ay -	8 15	7 - 8		Reefs -			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.	Australia, West Coast.			
Lizard Island -	9 15	7 - 10		Cockburn Sound -	9 0	1 - 1½	
Willis Islets -	8 0	6		Warnboro' Sound -		3 - 4	
Osprey Reef -	8 36	6		Koombanah Bay -	9 0	½ - 3	
Flinders Group -	9 15	8 - 12		Port Grey, Swan } River - - }	9 0	1 - 1½	
Cape Sidmouth -	9 15	10					
Cape York -	11 15	10	7				
Torres Strait.				Australia, South Coast.			
Sir Cs. Hardy Is. -	9 15	10		Corner Inlet -	11 40	8	
Raine Island -	8 10	10		Wilson Promon- } tory - - }	2 0	10	
Wallis Island -	Irreg.	7		Port Western -	1 10	8	
Cape Possession -	9 0	6		Port Philip, Entrance	1 30	3 - 4	
Possession Island -	1 0	9½		„ Queenscliff	1 30	3	
Darnley Island -	9 30	12		„ Capel Bay	2 30	3 - 4	
Bramble Cay -	9 15	12		„ Hobson Bay	3 0	3 - 4	
Murray Islands -	9 30	10		Melbourne - -	1 20	3	
Adolphus Island -	12 15	10		Lady Bay - -		4	
Albany Islands } (Port Albany) }	12 15	10	7	Geelong Harbour -	2 50	2½	
Australia, North Coast.				Port Fairy - -		4	
Endeavour Strait, }	1 0	9½		Portland Bay -	Midnight	4	
E. Entrance - }				Macdonnel Bay -	3 0	5	
Booby Island -	4 30	8		Rivoli Bay -	10 0	4	
Albert River (Kan- }	7 30	10 - 13		Port Elliot -		5 - 6	
garoo Point - }				Troubridge Shoals	3 30	6	
Wellesley Isles -	7 30	8 - 12		Port Adelaide -	5 44	6	
Sir E. Pellew Isds.	7 30	4 - 7		Cape Willoughby, }	4 10	6	
Investigator Road -	8 0	9		Kangaroo Id. - }			
Arnhem Bay -	8 0	6 - 8		Pelican Lagoon, }	5 0	6	
Goulburn Isles -	6 0			Kangaroo Id. - }			
Alligator River -	8 40	19 - 20		Spencer Gulf:			
Shoal Bay - -	6 0	18 - 25	14 - 20	Thorny Passage	12 0	6 - 8	
Port Essington -	3 24	13		Point Riley -	5 45	4½	
St. Asaph Bay -	5 45	14		Point Lowly -	7 0	6 - 8	
Swift Bay - -	12 0	21		Port Augusta* -	8 30	9 - 12	
Port Darwin -	5 30	17 - 24		Wallaroo -	irr.	4 - 5	
Australia, North West Coast.				Gambier Islands -	1 50	3	
Victoria River, }	7 15	15 - 24		Port Eyre - -	10 30	6	
Turtle Point - }				St. Francis Isle, }			
„ Mosquito Flat	0 19	7 - 13		Petrel Bay - }	12 0	6	
„ Sandy Island	1 17	3 - 10		Blancheport, }			
Prince Frederick }	12 0	28		Streaky Bay - }	1 0	5	
Harbour - - }				Smoky Bay -	12 15	6	
St. George Basin -	12 15	25		Denial Bay -	12 15	6	
Careening Bay -	11 45	30		Fowlers Bay -	10 30	6	
Admiralty Gulf -	12 0			Venus Harbour -	2 15	6	
Brunswick Bay -	12 0	24		West Cape Howe -	9 0	6	
Camden Harbour -	12 0	37½		Princess Royal }	11 56	1 - 4	
Collier Bay - -	11 45	36		Harbour - - }			
Sharks Bay -	12 0	2-5		Bass Strait.			
Houtman Rocks -	11 30	2½		Refuge Cove -	12 5		
Champion Bay -	9 10	1		King Island -	1 0		
				Hunter Island -	11 30	8	
				Three Hummock }	10 30	10	
				Island, E. side - }			
				Swan Island -	9 35	6	
				Glennie Islands -	12 20		
				Kent Island -	11 10		
				Murray Pass -	11 10	8	

* At Port Augusta, when the wind veers round to West and South and blows strong, the rise has been as much as 16 feet. Commander John Hutchison, R.N., Admiralty Survey, South Australia, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Charge.	Rise.	
		Springs.	Ncaps.			Springs.	Ncaps.
<i>Tasmania.</i>							
	h. m.	ft.	ft.		h. m.	ft.	ft.
R. George	11 15	12½		Pouinipet Island, } Caroline Islands }	6 0	4½	
Launceston	1 0	12½		Seypan Island, } (Ladrone Ids.)- }	6 45	2½	
thur	7 52	4		Pelew Islands		6	
wn	8 15	4½	3½	<i>South America, Strait of Magellan.</i>			
rie Har-	7 30	3		Cape Virgin	8 30	36 - 42	
Head	12 0	9		Cape Espiritu Santo	8 30	36 - 42	
Har	1 0	6		Possession Bay	9 0	36 - 42	
lymple	12 5	10		Cape Orange	3 0		
ne Point	9 39	7		First Narrows	9 0	36 - 42	
<i>Islands in South Pacific.</i>				Philip Bay, east side	9 30	24	
Island	2 0			Gregory Bay	9 45	23	
and	2 40	3		Second Narrows	10 0	23	
Id.		3		Peckett Harbour	12 0	6	
Ofahene Id	noon.	1½		Laredo Bay	11 30	9	
on Bay,				Santa Magdalena	12 0	10	
Christina,	2 30	4		Island			
uesas				Port Famine	12 0	6	
Id.		4		Cape San Isidro	1 0	8	
Id.	6 50	4		St. Nicolas Bay	2 6		
Resolution,				Cape Froward	1 0		
n Island	5 35	3		Port San Antonio	12 0	7	
Ancientum,	6 35	4		Labyrinth Islands	0 30	5½	
Id.				Port Gallant	9 0	5½	
Id.	7 24	4		York Road,	2 0	9	
Id.	6 0	6?		English Reach			
Id.				Bachelor River	1 40	5	
Id.	6 47	5½		Borja Bay	1 50	6½	
Id.				Playa Parda Cove	1 8		
Id.	6 30	4?		Port Tamar	3 5	5	
Id.				Valentine Harbour	2 0		
Id.	8 6	4		Harbour of Mercy	1 22	4	
Id.				Cape Pillar	1 0		
Id.				<i>Smyth, Sarmiento, Wide, and Messner Channels.</i>			
Id.				Goods Bay	0 30	7	
Id.				Fortune Bay	0 50	7	
Id.				Welcome Bay	0 50	7½	
Id.				Puerto Bueno	1 40	8?	
Id.	8 25	4		Guia Narrows	2 10	8	
Id.	5 50	4½		Fury Cove	1 15		
Id.	7 15	4		Eden Harbour	12 30	5	
Id.				Halt Bay	0 30	8	
Id.				Middle Island	12 0		
Id.				<i>Tierra del Fuego, S.W. Coast.</i>			
Id.	8 30	6		Cape Horn	4 40	9	
Id.	7 45	7		St. Francis Bay	4 0		
Id.	12 0	5		St. Martin Cove	3 50	8	
Id.	6 0	5		Middle Cove	3 30		
Id.				Goree Road	4 0	8	
Id.				Lennox Cove	4 40	8	
Id.				Nassau Bay	4 0	6	
Id.				Good Success Bay	4 3	6-8	
Id.				Packsaddle Bay	3 30	6	
Id.				Orange Bay	3 30	5	
Id.				New-year Sound	3 30		
<i>Islands in North Pacific.</i>							
Bay,	3 49						
Id.							
Id.	4 0	2					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Adventure Cove -	3 10	4		Onicavi Bluff -	0 57	20	
March Harbour -	3 10	6		Oscuro Cove -	0 55	20	
Doria Cove -	3 0	4		Lobos Head -	0 29		
Stewart Harbour -	2 50	4		Compu Inlet -	1 10	17	
Townahend Harbour -	2 30	5		Cullin Island -		■	
Fury Harbour -	2 30	4		Huapilinao Head -	1 25	15½	
North Cove, Fury } Island - - }	2 30	4		Reconlavi Inlet -	0 44	14	
Hewett Bay -	0 30	6½		Puluqui Island -	1 5		
Bedford Bay -	0 30	7½		Calbuco Fort -	1 18 or 0 47	18	
Smyth Harbour -	12 0	6½		" Beach -	1 15	16	
Noir Island -	2 30	5		Abtao Island -	0 50	18	
Laura Harbour -	1 0	6		Tres Cruces Point -	1 15	■	
Cape Castlereagh -	2 50	■		Chacao Bay -	0 40	14	
Cape Gloucester -	1 30	5		" Narrows -	1 15	16	
Cape Inman -	2 0	■					
Latitude Bay -	2 5	4			<i>Chile.</i>		
Week Islands -	2 0	5		Coyhuin River -	0 52	21	
Dislocation Harbour -	1 40	4		Port Valdivia -	10 35	5	
Diego Ramirez } Islands - - }	4 0	6		Mocha Island -	10 30		
				Lentu River -	10 30	5	
				Santa Maria Island -	10 20	6	
				Arauco Bay -	10 15		
				Talcahuano -	10 14	5	
				Maule River -	10 0		
				Toro Point -	9 45		
				Valparaiso -	9 32	5	
				Juan Fernandez } Island - - }	9 30	4	
				Pichidanque Bay -	9 20	5	
				Port Herradura -	9 8	5	
				Coquimbo Bay -	9 8	■	
				Port Huasco -	8 30	6	
				Copiapo -	■ ■ ■	5	
				Port Flamenco -	9 10	5	
				Lavata Cove -	9 20	■	
				Grande Point -	9 45	5	
				Paposo -	9 40	5	
					<i>Bolivia.</i>		
				Constitucion Cove, } Moreno - }	10 0	4	
				Port Mexillones -	10 32	3	
				Cobija Bay -	9 54	4	
				Paquique or San } Francisco Point }	9 45		
					<i>Peru.</i>		
				Iquique Road -	8 45	5	
				Lobo Point -	8 0		
				Arica Road -	8 0	5	
				Ylo Road -	8 15	6	
				Ialay -	8 53	7	
				Quilca River -	8 0	6	
				Point Lomas -	8 19	5	
				Atico Road -	8 53	5	
				Port San Juan -	8 10	3	
				" San Nicholas -	8 15	3	
				Yndependencia Bay -	4 50	4	
<i>Patagonia, West Coast.</i>							
Evangelists -	1 0	5					
Port Henry -	12 0	5					
" Barbara -	12 28	4					
San Tadeo River -	11 45	6					
Port San Domingo -	12 0	7					
Piti-Palena -	12 23	10					
Tiotoc Bay -	1 45	11					
<i>Chonos Archipelago.</i>							
Port Otway -	11 37	6					
San Andres Bay -	0 45	5					
Port San Estevan -	0 15	5					
Anna Pink Bay -	0 45	5					
Vallenar Road -	0 18	5					
Port Low -	0 40	7					
<i>Chilos Archipelago.</i>							
Huaso Island -	12 0	7					
Cucao Bay -	12 0	6					
Port San Carlos, } Town - - }	11 15	6					
Port San Carlos } Pt. Arenas - }	0 14	6					
" English } Bank - - }	0 4						
Caremapu -	0 50	10					
Petucura Rock -	0 50	16					
San Pedro Passage -	0 30	9					
Huillard Inlet -	0 48	16-20					
Quelan Cove -	0 28						
Talcan Island -	1 3	15½					
Alan Island -	0 31	■					
Poqueldon Harbour -	0 54	18					
Castro -	0 11	18					
Dalcabue -	0 26						
Changues Islands -	0 35						

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.	Central America, West Coast.			
	4 50	4			h. m.	ft.	ft.
y	5 47	4		Nicoya Gulf (Port	3 9	10	
Bay	4 45	3		Herradura)			
	4 50	3		Port San Juan del			
Bay	6 10	2		Sur	3 8?	10?	
or							
cho Bay	6 30	2		Port Realejo	3 6	11	
abrigo	5 0	2		Port la Union,	3 15	10½	8½
que Road	4 0	3		G. of Fonseca			
a	3 20	3		Acajutla Road	2 25	9	
Point	4 0	10					
Ecuador.				Mexico, West Coast.			
Island	4 0	11		Port Guatulco	1 30	5	
ndy Point of	5 0	11		" Sacrificios	3 15	6	
nd	6 0	11		Acapulco	3 6	1½	
l	7 0	11		San Blas	9 41	6½	
Bay	1 18	8		Mazatlan	9 40	7	
d.	0 41	12		Guaymas Harbour	8 0	4	
ta	3 4	6					
River	3 30	10		California and Oregon.			
ado	3 30	10		San Lucas Bay	9 20	9½	
Bay	3 37	13		Magdalene Bay	7 35	6½	
River	3 30	13		Port San Quentin	9 5	9	
Road	2 33	12		Bartho-	9 10?	7-9?	
ga (en-	4 10	9		lomew	9 10?	7-9?	
				Playa Marie Bay	9 20?	7-9?	
Galapagos Islands.				Cerros Island	9 10	7-9	
Island	2 10	6		Sta. Barbara Island	8 0	3½	
e "	2 0	6		San Diego Bay *	9 38	5	3½
" "	2 23	6½		San Juan Anchor-	9 40?	5	
ble "	1 56	6		age	9 39	4½	3½
West-end	3 10	5		San Pedro Bay *	9 39	4½	3½
side	2 34	5		San Miguel,	9 25	5	4
dam Cove	2 14	5		(Cuyler Harb. *)	9 30?	5?	4?
Id.	?	?		San Rosa Island	9 35?	5?	4?
Isles	2 10			Santa Catalina Id.	9 35?	5?	4?
New Granada and Veragua.				Santa Cruz Id.	10 8	4½	3½
aventura	4 0	13		San Luis Obispo *	10 22	4½	3½
la Reef)				Monterey *	10 37	4½	3½
ie Town	6 0	13		South Farallon *	12 6	4½	3½
River	6 0	12		San Francisco	11 17	4½	3½
ay	3 40	12		" North Beach *	12 2	5½	4½
a	4 0	12		Bodega Port *	11 26	6½	4½
ay	3 30	13		Humboldt Bay *	0 15	7½	
ay	3 30	13		Port Orford *	0 42	7½	6
y	3 15	14		Columbia River,	12 33	7½	6½
ver	3 40	16		Entrance	3 49	5½	5
onzales,	3 50	16		Fort Steilacoom *	4 46	11	9½
chi Id.)							
ay	4 0	16		Vancouver Island and Juan de Fuca Strait.			
	4 0	14		Esquimalt	irr.†	7-10	5-8
Road	3 23	15-22	10-16	Fane Island,	irr.	12	
vo	3 10	12		P.umper Sound	irr.	7-10	
land	3 15	10½		Victoria	irr.	7	
				Port Discovery	2 30		

U.S. Survey, the times of High Water being the Corrected and not the Vulgar Establishment.
 May to October, from Midnight to 3 am. November to April from Noon to 3 pm.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	
Nisqually, Puget Sound - }	6 0	18	15	Shucartie Bay -		12	
Semiahmoo Bay - }				Bull Harbour, } Goletas Channel }	0 30	12½	
(Drayton Harbour) - }	2 0	12		Barclay Sound, } Island Harbour }	12 0	12	
Fraser River (entrance) - }	6 30	7-10		" Uchucklesit Harbour - }		12	
Burrard Inlet, } G. of Georgia - }	6 0	16		Clayoquot Sound -	12 0	12	
Plumper Cove, } Howe Sound* }	noon.	12					
Port Graves ,, * }	noon.	12		<i>America, North West Coast.</i>			
Nanaimo Harbour } G. of Georgia - }	5 0	14		Port Kuper -	1 40	13	
Nanoose Harbour, } Vancouver Id. }	5 0	15		Portland Inlet, } (Salmon Cove) }	1 8	16	
Penden Harbour, } Strt. of Georgia* }	6 0	12-14		Sitka† -	0 34	5-7	
Gowlland Harb., } Discovery Passage - }	5 30	11		Behring Bay -	0 30	9	
Knox Bay -		11		Port Etches -	1 15	9½	
Beaver Cove -		15		" Chalmers -	1 0	13½	
Alert Bay, Cormorant Id. - }		15		" Chatham -	1 0	12	
Beaver Harbour -	0 30	15¾		Ounalashka Island	7 30	7½	
				Cape Roshnoff -	7 30	15	
				Good-news Bay -	6 15	13½	
				Golovnin Bay -	6 23	3¾	
				Port Clarence -	4 25		
				Chamisso Island -	4 42		

* From observations made in the month of October.

† The rise at Sitka as given by Commander Pearce, H.M.S. Alert, in his remarks in 1860, does exceed 7 feet, but on the authority of Commander Pike, H.M.S. Devastation (1862), the local people say that the rise sometimes is as much as 16 feet.

T I M E

OF

HIGH WATER ON FULL AND CHANGE DAYS

AT THE PLACES GIVEN IN THE PRECEDING PAGES;

ARRANGED ALPHABETICALLY;

*With the Rise of the Tide at Springs and Neaps.**

ery, thus?, is placed after the Time of High Water and the Rise, it indicates that what are given are approximations.)

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
hamas - -	8 0	3		Aggerminde, Jutland -	4 9	2	
ad, England -	11 10	23	17½	Agnes, St., Scilly Isles -	4 30	16	12
uri, Indian Ocean	8 30	6		Agoada Pnt., Hindoostan,	10 30	9	
Scotland - -	1 0	12	10	W. Coast.			
r, Wales - -	8 0	15		Agulhas Cape, Africa, S.	2 50	5	
, France - -	4 14	22	16	Coast.			
th, Wales - -	7 31	13½	10	Air Point, River Dee,	10 54	25	19
Brazil -	4 48	6		England.			
atagonia, W.C.	0 50	18		Aix, Ile d', Charente R.,	3 20	17	12½
, Persian Gulf	7 30	7		France.			
entral America	2 25	9		Akaroa Harb., New Zea-	3 24	8	6
Mexico, W. Cst.	3 6	1¼		land.			
ead, Sumatra -	8 45	8		Akasi, Japan Sea -	6 36	6½?	
Ireland - -	5 14	10¾	8	Akyab, Aracan R., Bay	9 45	9	6
ort, (Sullivan	0 15	8		of Bengal.			
ellow Sea.				Al Bidá, Persian Gulf -	8 30?	6?	
— (Mary Id.)	2 0	10		Alabat Harbour, Luzon -	10 0	9	
Sea.				Alan Island, Patagonia,	0 31	18	
ort, Australia,	5 44	6		W. Coast.			
				Albany Ids. (PortAlbany)	12 15	10	7
adjacent Bays,	{ 7 30 to 9 30 }	7	4½	Australia, E. Coast.			
S. E. Coast.				Albemarle Id., Galapagos	2 0	6	
Flores, Malay		8		Fort, Falkland	7 15	7	
lago.				Islands.			
G., Australia,	12 0			Albert River (Kangaroo	7 30	10-13	
ast.				Point) Australia, N.			
d., Torres Strt.	12 15	10		Coast.			
l, Maldives -	1 0	4		Aldborough, England -	10 45	8?	6½?
te Atoll, Mal.	3 0	4		Alderney, English Chan-	6 46	17	12¾
				Alert Bay, Cormorant		15	
Cove, Tierra	3 10	4		Id., Johnstone Strait,			
o.				Vancouver Id.			
Port, New	12 20	8	6	Alexander Port, Africa,	3 0	5	
				S.W. Coast.			
-Sound, Falk-	5 30	5½		Algeçiras, Spain -	1 49	4	2½
nds.				Algoa B., Africa, S. Cst.	4 0	4-5	
Santa Cruz,	12 45	9		Alligator Rvr. Australia,	8 40	19-20	
				N. Coast.			

Rise of the Tide is meant its vertical rise above the mean low-water level of Spring Tides.
M

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Ri
		Springs.	Neaps.			
	h. m.	ft.	ft.		h. m.	ft.
Alloa, Firth of Forth, Scotland.	3 18	17½	15	Aor Pulo, Sumatra, N.E. Coast.		5
Altona, Germany - -	5 19	7		Aotea Harb., New Zealand	10 0	12
Amboyna, Moluccas - -	0 33	7		Apalachicola B., Gulf of Mexico.		2½-4
Ameland Gat, Netherlands	9 0	7		Appetetat B., Gulf St. Lawrence.	11 10	5?
----- Hollum Rd., „	11 30	7		Appin Port (Loch Linnhe), Scotland.	5 26	12½
Amet Sound, Nova Scotia	10 30	8	5	Appledore, England -	5 28	23
Amiranté Isles, (St. Joseph Id.) Indian Ocean.	5 0	8½		Aquin Bay, St. Domingo	irr.	2-3?
Amlwch, Wales - -	10 30	18?	13?	Aracan R. (Bar), Bay of Bengal, E. Coast.	9 45	9
Amoy (Inner Harbour), China, East Coast.	12 0	16		Aracati, Brazil - -	6 0	8
Ampanam B., Lombok -	8 0	6		Araish El, Africa, N. Cst.	1 30	9-12
Amsterdam, Indian O. -	11 0	3		Arasaig, Scotland -	5 50	13½
Amulgawein, Persian G.	11 40	6		Arauco Bay, Chile - -	10 15	
Amur Strait, G. of Tartary	11 40	5-6		Arbroath, Scotland -	1 35	14
Andaman Ids., Port Blair, Indian Ocean.	10 0	9	6	Arcachon, France - -	4 37	11½
----- Port Cornwallis	10 0	8½		Arcas Rks. G. of Mexico	noon	1½
----- Strait, Indian Ocean.	10 24	9½		Ardglass, Ireland -	11 0	16
Andrava Bay, Madagascar.	3 30	7		Ardintallan, Loch Feochan, Scotland.	5 31	9
Andres, San B., Patagonia, W. Coast.	0 45	5		Ardrihaig, Loch Fyne -	11 53	9
Andrews, St., Bay, G. of Mexico.	irr.	1-2		Ardrossan, Scotland -	11 45	10
Anegada, Virgin Islands	9 0	1½		Arenas Pt., San Carlos, Patagonia, W. Coast.	0 14	6
Aneiteum, Inyang, S. Pacific.	6 35	4		Argyle, Bay of Fundy -	9 27	12½
Angoxa River, Africa, E.C.		13		Arica Road, Peru - -	8 0	5
Angra, Azores - -	12 32	4½		Arichat, Nova Scotia -	8 10	5
----- Bank, Hindoostan, W. Coast.	10 30	9		Arinagour, Coll Id., Scotland, W. Coast.	5 39	12½
----- Pequena, Africa, S.W. Coast.	2 30	8		Arkhangel, White Sea -	7 28	2½
Anna Pink B., Patagonia, W. Coast.	0 45	5		Arklow, Ireland - -	8 45	4
Annan Foot, England -	11 56	20	14	Arnhem B., Australia, N.C.	8 0	6-8
Annapolis, United States	4 38	1	1	Arroa, Malacca Strait -		10
Anne, St. B., Cape Breton	8 34	6	4½	Arthur Port, Tasmania -	7 52	4
Annisquam, United States	11 0	10¾	9	Arundel, England -	12 25	
Anno Bom Id., Africa	3 45	5		----- (Bar) - -	11 35	16
Anticosti Id., G. St. Lawrence, East Cape -	1 0	5	3	As Rocas, S. Atlantic -	5 15	10
„ Bear Bay -	1 10	5	3	Asaph St., B., Australia, N. Coast.	5 45	14
„ West Point -	2 0	6	4	Ascension Id., S. Atlantic	5 30	2
Antigonish Harb. R. St. Lawrence.	9 0	4	2	Askaig Port, Islay -	4 58	6½
Antigua Id. (English Harb.), Caribbean Sea.		2		Astoria, Oregon -	0 42	7½
Antongil Bay (Port Choiseul), Madagascar.	4 0	5		Atacames Bay, Ecuador	3 37	13
Antonio Cape St., Cuba		1½		Atchafalay Bay, G. of Mexico.	irr.	2-2½
Antonio St. Port, Patagonia, E. Coast.	10 40	28		Athline, Loch Seaforth -	6 16	15
----- Ma-	12 0	7		Atico Road, Peru - -	8 53	5
gellan Strait.				Auckland Harb., New Zealand, N. Island.	7 5	11
Antrobus Id., G. St. Lawrence.	10 30	5	3	Augustine St., U. States	8 21	5
Antwerp, Belgium - -	4 25	15		----- St., B., Madagascar, W. Coast.	4 30	13
				Aux Cayes Bay, St. Domingo.	irr.	2-3?
				Avatcha B., Kamchatka -	3 30	6½
				Avon Isles, Australia, E.C.	8 30	5
				Avon River, Bigbury Bay, England.	5 47	16½

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
a (Inland Sea)	0 14	7		Barbados, Caribbee Ids.	irr.	2	
R., New Zealand	7 44	7		Barbara Port, Patagonia, W. Coast.	12 28	6	4
frica, W. Coast-	4 30	4		——— L Santa, California	8 0	3½	
ay, Yellow Sea	2 40			Barbe St., Sumatra, N.E. Coast.	6 0	6	
, Persian Gulf -	11 20	6		——— Sta. Id., California	8 0	3½	
tland - - -	11 50	8½	7½	Barclay Sound (Island Harbour), Vancouver Island.	12 0	12	
int of, I. of Man	11 7	20?	16?	——— Uchucklesit Har-		12	
landeb, G. of Aden	12 0	7		bour, Vancouver Id.			
River, Magellan	1 40	5		Bardsey Id., Wales -	7 40	15	
, China Sea, E.C.	10 0	6		Barfleur, France - -	8 51	17	13½
l., Linga Bay,	6 0 PM	12		Barmouth, Wales - -	7 41	17	13½
ra.*				Barnstable, United States	11 22	10	8½
3. (S. Cst.), Baly	11 0	9½	11	Barnstaple Bar, England	5 30	19	14
River, Sherbro				Barnstaple Bridge, Eng-	6 28	10½	7½
Africa.				land.			
razil - -	3 30	8		Barquero (entrance),	3 0	15	
Persian Gulf -	5 30	7		Spain, N. Coast.			
Id., China Sea,	11 0	5		Barra, Id. (North Har-	5 48	11½	8½
st.				bour), Scotland, W. C.			
arb., New Cale-	6 30	4?		Barracouta Harb., G. of	10 0	3½	
agan Id., Borneo,	10 0	6-8		Tartary.			
st.				Barragan Bay, Rio de la	7 0	5-9	
R., B. of Bengal,	10 0	15		Plata.*			
ast.				Barren Id., China Sea, E.	9 30	5½	
in, Ireland -	10 40	11		Coast.			
d, United States	7 26	5	4½	Barren Ids., Madagascar	4 45	12	
ish (Loch	5 43	11		Barrow Harbour, New-	7 10?	5?	
, Scotland.				foundland.			
arty, Dungarvan,	5 12	12½	9½	Barton Port, (Bubon	10 55	6	
llig Bay, Ireland	3 40	12	7½	Point), China Sea E.C.			
le B., Ireland -	6 25	3	2	Bas, Ile de, France -	4 49	23	17
n, Ireland -	4 54	12	9½	Básidúh, Persian Gulf -	12 0	10	
ane, Kenmare	3 42	10½	7½	Basil Bay, Korea, W. C.	4 15	18	10
Ireland.				Basque Port, Newfound-	8 55	5½	3½
ll Bay, Ireland	4 40	12½	9½	land.			
(Bar), Ireland	5 22	11½	8½	Basrah (Bar), Persian	12 0		
re (Quay),	6 0	8½	5½	Gulf			
				——— Town - -	6 0?	9?	
non (Bar) -	5 18	11½	8½	Bassein R., Bay of Bengal.	10 0	9	6
, Ireland -	5 23	12½	8	Batanes, Bashee Islands,		4	
tland - -	9 45	6	4½	China Sea, E. Coast.			
, Ireland - -	4 23	10½	8½	Batavia, Java - -	10 0	2	
United States	6 33	1½	1½	Batchian, Gilolo, Moluccas	1 0	6	
s., Africa, W.C.	8 15	9		Bate (Gulf of Cutch),	12 20	12	8
R., (entrance)	2 0	12		Hindoostan, W. Coast.			
stan, W. Coast.				Bathurst, G. St. Lawrence	3 15	7	4
oluccas -	4 0	6?		Bathz, Netherlands -	3 15	15	
úleh, G. of Aden	6 45	6		Batiscan, R. St. Lawrence	9 48	3½	2
rí, Gulf of Aden	8 45			Batticalao River, Ceylon	5 0	2-3	
áb, Ind. Ocean	7 0	7		Bay of Harbours, Falk-	6 0	5	
ikam, Arabia,	10 0	8½		land Islands.			
ast.				Bay of Islands. (Motu	7 15	9	6
tland - -	0 28	10½	8	Mea Islet,) New Zealand.		2	
ava - -		5		Bay of Mercy, Banks Land			
arb., Ireland -	3 47	10	7½	Bayonne (Bar), France -	3 45	12	10
Bay, Gulf of	irr.	1½		Bazaruto Cape, Africa, E.C.	4 15	10	
				Beachy Head, England -	11 20	20	15

observations made in the month of September by W. Stanton, Master Commanding H.M. brig Saracen.

Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs, Neaps.				Springs.	
		h. m.	ft.			h. m.	ft.
Bear Cape, Prince Edward Island.	9 0	6	3	Bias Bay (Tsangchow Id.) China, E. Coast.	8 30		
Bear Head, C. Breton Id.	8 30	4½	3	Bic Id., G. St. Lawrence	2 15	14	
Beaubère Id., Gulf St. Lawrence.	6 30	6	4	Biddah R., B. of Bengal, W. Cst.	10 0	14	
Beaufort, United States -	7 26	3½	2½	Bideford, England -	6 7	16	
Beaulieu, England -	{ 10 25 12 15	10	8½	Bijouga Islands, Arcas Channel, Africa, W. Cst.	10 10	11-14	
Beaumaris, Wales -	10 32			21½	16½	Bissao, Africa, W. Cst.	11 0
Beaver Cove, Vancouver Island.		15		Orango Channel, Africa, W. Cst.	10 0	11	
— Harbour, Vancouver Island.	0 30	15½		Bilbao (Bar), Spain -	3 0	15	
— Nova Scotia -	7 40	6½	4½	— (Town), „ -	3 20	9	
Bedeque Harbour, Prince Edward Island.	10 15	7	5	Biloxi, G. of Mexico -	irr.	2	
Bedford Bay, Tierra del Fuego.	0 30	7½		Bima Bay, Sumbawa -	Noon.	6	
Behring Bay, America, N.W. Cst.	0 30	9		Binkang B. China Sea, W. Cst.	11 30	5	
Belfast, Ireland -	10 43	9½	8	Binnie, France -	6 3	30	
Belgrano Port, La Plata	6 0	12	10	Bintula R., China Sea, E. Cst.	5 45	6	
Bell Sound, Spitzbergen	8 56	3½		Bird Island, China Sea, E. Cst.	9 30	6	
Belles Amour B., Labrador	9 0	4½	2½	— Ids., Africa, S. Cst.	4 0	4.5	
Belligum Bay, Ceylon -	2 20	2½		— Id. Light, United States.	7 59	3½	
Bellona Reefs (Middle), Australia, E. Coast.	8 30	6		Blaavand Point, Jutland	1 44	5	
Bembatooka Bay, Madagascar, W. Cst.	4 30	16		Black Ball Harb., Ireland	3 40	9½	
Bembridge Pt., England	11 0	14	10½	— Rock, Bay of Fundy	11 29	36	
Bencoolen, Sumatra -	6 0	3-5		Blacksod Bay (Quay), Ireland.	4 47	10	
Benevente, Brazil -	3 0	5		Blair Harb., China Sea, W. Cst.	8 50	9	
Benguela, Africa, W. Cst.	2 30	5?		Blakeney, England -		9	
Benin R., Africa, S. Cst.	4 30	7		— (Bar) „	6 30	15	
Benton Castle, Cleddau River, Wales.	6 23	20	14½	Blanche Port, Streaky Bay, Australia, S. Coast.	1 0	5	
Berbereh or Burburra (Gulf of Aden) Africa, E. Cst.	7 15	9		Blankenberg, Belgium -	12 48	13	
Berbice, Guayana -	4 30	11?		Blanco Cape, Africa, W. C.	11 46	6	
Bergen, Norway -	1 30	4		Bias, San, Mexico, W. Cst.	9 41	6½	
Berkeley Sound, Falkland Islands.	5 0	7		— La Plata -	2 0	12	
Bermudas: Ireland Id., N. Atlantic.	7 14	4		Blasket Islands, Ireland -	3 30	11½	
Bernera, Loch Roag, Lewis Id.	6 11	11	8	Blewfields, Mosquito Coast	1 50	2	
Berneray I., Sound of Harris.	6 11	13	9½	Bligh Sound, New Zealand.	10 45	8	
Bernap Point, Banka Strait.	6 30	12		Block Id., United States	7 36	3½	
Bersimis R., Gulf St. Lawrence.	2 0	12	7	Bluff Cay, Bahamas -	7 0	4½	
Berwick, Scotland -	2 18	13	11½	Bluff Harb., New Zealand	1 13	8	
Betcheween Harb., G. St. Lawrence.	11 32	5	3	Blyth, England -	3 15	15	
Beypoor R. (entrance), Hindoostan, W. Cst.	0 15	5		— R., Southwold, England.	10 20	6½	
Bias Bay (Tooniang Id.,) China E. Coast.	8 0			Bodega Port, California	11 17	4½	
				Bodkin Light, United States.	5 42	1½	
				Bojador Cape, Africa -	12 0	8°	
				Bolt Head, England -	5 45	15?	
				Bombay Dockyard, Hindoostan, W. Coast.	11 40	12-17	
				Bonacca Id., Bay of Honduras.	9 0	1½	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Spain -	2 0	12½	8	Broken Bay, Australia,	8 0	6-9	
Esperance Harb.,	9 15	5	2½	E. Coast.			
St. Lawrence,				Broom Loch (Ullapool)	6 40	14½	10½
C., Africa, Wst.	5 0	9		Broughty Ferry, Scotland	2 22	14½	11
Island, Australia,	4 30	8		Brouwershaven, Nether-	2 15	10	8
Island.				lands.			
St. France -	6 50	14	12½	Brut River, Borneo -	3 0	11	
Magellan Strait	1 50	6½		Bruni R., China Sea, E.	11 0	12	
(Road) Germany	10 30	8-10		Coast.			
St. England -	5 15	25	17½	Brunsbüttel, Germany -	1 58	9	
Sluice), England	7 0	12		Brunswick B., Australia,	12 0	24	
Deep (Clay Hole),		21½		N.W. Cst.			
Job Hole -		17		Brush, Yarmouth, England		5½	4½
Charlestown Naval	11 27	11½	10	Bubon Point, Port Barton,	10 55	6	
United States.				China Sea, E. Coast.			
Light, United States	11 12	11	9½	Buctouche River, G. St.	3 30?	4?	2½?
Bay, Australia, E.	8 15	7-8		Lawrence.			
				Budehaven, England -	5 45	23	17
St., Madagascar -	4 30?	15?		Buenaventura Port, Cen-	4 0	13	
France -	3 39	8½	6	tral America (Negrilla			
Harb., Prince	8 40	5	2½	Reef).			
Id Island.				" off the town -	6 0	13	
St. France -	11 25	25	19½	Buenos Ayres, S. America,	12 0	3-5	
Id, Indian Ocean, see Reunion Id.				E. Coast.*			
Majeli Bay) Mo-	1 0	6		Buffalo R. (entrance),	3 45	4½	
				Africa, S. Cst.			
nd, S. Pacific -	2 40	3		Bulama Island (Arcas	10 10	14	11
ort, Australia, E.	9 35	16		Channel), Africa, W.			
				Coast.			
R. Clyde, Scot-	0 39	9		Bull Harbour, Goletas	0 30	12½	
				Channel, Vancouver Id.			
B., Madagascar,	4 30	15		Bull Id., Newfoundland	7 22	3½	2
t.				Bulls Id. Bay, United States	7 16	5½	4½
Bay, Labrador -	6 45	4	2	Balls Mouth (Achill	5 38	10½	7½
Harbour, New-	7 0?	2-3?		Sound, N. entrance,) Ireland.			
nd.				Balsaur R., Hindoostan,	1 45	18	
Cay, Torres Strt.	9 15	12		W. Cst.			
Pots, River St.	3 0	17	10	Buluagan O'sta Ana Port,	12 0	5½	
nce.				Philippines.			
ver, Africa -	4 0	6		Bunawe (Loch Etive),	7 54	5½	
frica, E. Cst. -	4 30	8		Scotland.			
ad, Ireland -	10 45	12	9½	Buncrana, Ireland -	5 40	16	
iver, G. of Mexico	irr.	1½		Bussan, Scotland -	5 24	12	8½
France -	5 51	31	23½	Burburra, see Berbereh.			
ance -	3 47	19	13½	Burn Harbour, New-	8 45	6½	4½
rt, United States	11 11	8	6½	foundland.			
ster (Bar) England	6 50	35	26½	Burntisland, Firth of Forth,	2 24	16½	12½
on, England -	4 39	16	12	Scotland.			
England -	0 5	11½	7½	Burntisles, Kyles of Bute,	11 50	10	8
Netherlands -	3 0	5		Scotland.			
, England -	11 15	19½	16	Burong I., China Sea -	4 45	7	
ling Road) Eng-	6 56	44	33	Burrard Inlet, Gulf of	6 0	16	
				Georgia, America,			
Bay, Sumbawa	1 0	11-12		N. W. Coast.			
Sound, Mada-	4 0	9½		Burry Port, Wales -	6 1	25½	18½
E. Cst.				Bushire, see Abú-shehr.			
ound, Australia,	11 0	20-30		Bussorah R. Bar, Persian	13 0		
				Gulf.			
ven Har., Ireland.	5 0	10½	7½	Busuanga, Burias Island	12 30	6	
y R. (entrance),	11 0	7½					
E. Coast.							

* Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.
		Springs.	Ncaps.			Springs.
	h. m.	ft.	ft.		h. m.	ft.
Button Islands, Hudson Strait.	6 50			Canso Gut (Plaister Cove), Nova Scotia.	9 10	4½
Byron Bay, Australia, E. Coast.	9 45	6		Har., C. Breton Island.	7 48	6½
— Cape, Australia, E. Coast.	9 45	6		Cantin Cape, Africa -	10 0	10
Cabita Bay, New Granada.	3 40	12		Canton River (entrance), China.	10 0	8
Cacheo River, Africa, W. Coast.	7 45	8		Canton River } In Mar.	2 40	5½
Cadiz, Spain - -	1 45	9½		(Kuper Id.) } In May & June	1 40	5½
Caen, France - -	10 57			Cape Coast Castle, Africa, W. Coast.	4 30	6
Caermarthen (Bar) -	6 10	26	19½	Cape May Landing, U.S.	8 19	6
Caernarvon, Wales -	9 33	13½	10½	Caracas River, Ecuador -	3 30	10
Caimites, St. Domingo -	8 0?	1?		Caraquette Harbour, G. of St. Lawrence.	2 40	6
Cairnlough, Ireland -	10 51	5½	5	Cardiff, Wales - -	6 59	38
Cajeli Bay, Bouro -	1 0	6		Cardigan, Wales - -	7 1	12
Calais, France - -	11 49	19½	15½	Bay, Prince Edward Island.	8 40	5
Calbuco Beach, Patagonia, W. Coast.	1 15	16		Careening Bay, Australia, N. W. Coast.	11 45	30
Calcasieu Fort, Patagonia, W. Coast.	{ 1 18 or 0 47	18		Caremapu, Patagonia, W. Coast.	0 50	10
— River, Gulf of Mexico.		2½	1½	Cargados Garayos Shoals, Indian Ocean.	2 0	4
Calcutta, Bengal - -	2 30			Cargreen, R. Tamar, England.	5 47	14½
Caldy Island, Bristol Channel.	6 0	24?	16?	Caribou Harbour, Nova Scotia.	10 0	6
Calebar R., Africa, W. Cst.	5 0	9		Carleton Point, Gulf St. Lawrence.	3 0	6
Caledonia Harbour, New Granada.	11 40	1½	1	Carlingford (Bar or Cranfield Point), Ireland.	11 0	14
Calf Sound, Isle of Man.	11 17	16½	13	Carlisle Port, England -	12 10	20
Calicut Roads, Hindoostan, W. Coast.	0 15	5		Carlos, San, Port, Patagonia, W. Coast.	11 15	6
Callao Bay, Peru -	5 47	4		— (Arenas Point) Patagonia W. Coast.	0 14	6
Calshot (Castle Pt.), England.	11 30	13	9½	— (English Bank) Patagonia W. Coast.	0 4	
Calstock, R. Tamar, England.	6 6	12½	8½	Carlos, San, Port, Falkland Islands.	7 0	8
Camaguin, Babuyan, Islands.	6 0	6		Carouge River, R. St. Lawrence.	7 15	16
Camariñas Port, Spain -	3 0	15		Carrigaholt, Ireland -	4 44	14
Cambing, Banda Sea,	noon	6		Carsaig, Scotland -	5 28	10
Camden Harb., Australia, N.W. Coast.	12 0	37½		Cartagena, New Granada	11 0	1½
Cameroon R., Africa, W. Coast.	4 0?	6		Carteret, France - -	6 25	31
Campbell Cape, New Zealand.	6 0	8	6	Port, New Ireland.		6
— Island South Pacific.	12 0	43?		Cascumpeque H., Prince Edward Island.	5 40	3
— Town, Gulf St. Lawrence.	4 0	10	7	Cashla Bay, Ireland -	4 33	16
Campbellton, Scotland -	11 45	8½	6	Casquets, English Channel	6 45	15½
Campeche, Yucatan -	1 45	2½	2	Castillos, Cape, Rio de la Plata.*	8 30	2
Campobello (Welchpool), B. of Fundy.	11 21	23½	20	Castlereagh Cape, Tierra del Fuego.	2 50	4
Cancale, France - -	6 20	37	27			
Canna Id., Scotland, W. Coast.	6 19	14	9½			

* In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by winds and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 ft.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neaps.			Spring.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
1. Bearhaven,	4 14	9 $\frac{1}{2}$	7 $\frac{1}{2}$	Charlowke R., Lapland	8 8	12	
Isle of Man -	11 10	20	16	Chateau Bay, Labrador -	7 35	3 $\frac{1}{2}$	1
Ascend, Ireland -	4 21	10 $\frac{1}{2}$	8	Chatham, England -	1 2	17 $\frac{1}{2}$	1 $\frac{1}{2}$
Is. G. of Tartary	10 30	6		Id., Galapagos	2 23	6 $\frac{1}{2}$	
Patagonia, W. Coast.	0 11	18		Port, America,	1 0	12	
Point, China	9 30	6 $\frac{1}{2}$		N. W. Coast.			
Coast.				ChatteCape, United States	12 0	13	8
Harbour, New-	7 0	■	■	Chauan Bay, China, E.	11 0	6 $\frac{1}{2}$	
nd.				Coast.			
Sta. L, Brazil -	2 30	3		Chansey, Isles de, France	6 9	35	26
Is. Australia, E.C.	8 0	6		Cheduba, Bay of Bengal-	11 30	8	
Cape, Yucatan -	9 30	1 $\frac{1}{2}$		Chee-fow Harb., Yellow			
Bridge, Stour	1 8	4 $\frac{1}{2}$		Sea, see Chifu.			
England.				Chentabun River China	10 0	5 $\frac{1}{2}$	
Is., New Zealand	8 0	7		Sea, W. Coast.			
land, China Sea,	9 30	5 $\frac{1}{2}$		Chepo River, New Gra-	3 40	16	
nd.				nd.			
Islands, Gulf St.	1 50	9	■	Chepstow, England -	7 30	38	28 $\frac{1}{2}$
ce.				Cherbaniani Reef, Lacca-	10 0	7	4
t, United States	9 30	1 $\frac{1}{2}$	1 $\frac{1}{2}$	dives, Indian Ocean.			
. Channel, U.S.	9 10	1 $\frac{1}{2}$	1 $\frac{1}{2}$	Cherbourg, France -	7 49	17	12 $\frac{1}{2}$
Guayana -	3 45	6-11		Chesilton, England -	6 13	10 $\frac{1}{2}$	7
France -	11 5	27 $\frac{1}{2}$	21	Chester (Crane Wharf),	0 16	26	
ys, United States	0 51	3 $\frac{1}{2}$	2 $\frac{1}{2}$	England.			
Spain, N. Coast	3 0	15		Chester River (Rockhall	5 23	2 $\frac{1}{2}$	1
L. (Foveaux St.)	12 15	8	■	Creek), United States.			
eland.				Chesterfield Islet, Aus-	8 30	5	
ahaay Harbour,	6 0	3		tralia, E. Coast.			
cas.				Chetican, C. Breton Id. -	8 15	3 $\frac{1}{2}$	
L, California -	9 10	7-9		Chichester, England -	11 30	14	11
frica, N. Coast -	2 6	3 $\frac{1}{2}$	1	Chifu, Yellow Sea -	10 0	■	6 $\frac{1}{2}$
icara Id., Trin-	3 30	4		Chimmo Bay, China, E.	10 20	16	
caribbean Sea,				Coast.			
Bay, Patagonia,	0 40	14		Chimney Id., Rees Pass,	11 30	12	
ast.				China, E. Coast.			
Narrows, Pata-	1 15	16		Chinchu Harb., China,	12 25	17	
W. Coast.				E. Coast.			
Inlet, New	11 5	8	6	Chin-hae, Yang R., China,	11 20	12 $\frac{1}{2}$	
nd.				E. Coast.			
s Port, America,	1 0	13 $\frac{1}{2}$		Chipiona, Spain -	1 34	12 $\frac{1}{2}$	8
Coast.				Chittagong (Bar), Bay of	1 15	18	10
Bay, New Gra-	4 0	■		Bengal, E. Coast.			
				Chodo Id., Korea, W. C.	6 20	12	
o Id., America,	4 42			Choiseul Port, Madagascar,	4 0	5	
. Coast.				E. Coast.			
on Bay, Australia	9 10	1		Chosan Harb. or Tsan-	7 45	7	■
ast.				liang-hai, Japan Sea.			
ain R., St. Law-	9 45	3	2	Christchurch, England -	{ 9 0 } { 11 30 }	{ 5 } { 8 }	
				Christiansted, Santa	7 30		
Id., China, E.C.	9 30	17		Cruz.			
es Ids., Patagonia,	0 35			Christmas Island, Indian	10 0		
ast.				Ocean.			
Road, Hang-chu	12 0	25		Christmas Harbour, Ker-	2 0	■	
China, E. Coast.				guelen Id.			
Cape, United	7 45	5		Chuen-pee Point, Canton	2 0	7 $\frac{1}{2}$	
				River.			
Id., Galapagos -	2 10	6		Chusan Archipelago,	9 40	14	
ton, United States	7 26	6	5	(Vernon Channel,)			
tetown, Prince	10 45	9 $\frac{1}{2}$	7	China, E. Coast.			
rd Island.							

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Chusan Tinghae, China, E. Coast.	11 0	12	9	Componee River, Africa, W. Coast.	10 0	15	1
Circular Head, Tasmania	12 0	9		Compu Inlet, Patagonia, W. Coast.	1 10	17	1
Clam Point, B. of Fundy	8 27	8½	6½	Concarneau, France -	3 12	13	
Clara Sta., L, Ecuador -	4 0	11		Condore, Cochin China -	3 0	4	
Clare I., Ireland -	4 38	12¼	9½	Congo River, Africa -	4 30	6	
Clarence Port, America, N.W. Coast	4 25			Congoon Bay, Persian G.	7 45	9½	
Clarence Harbour, Long Island, Bahamas.	8 30	4	3¼	Conil, Spain -	1 18	11½	
Clarke Harbour, Bay of Fundy.	8 40	9½	7	Conquet Road, France -	3 46	21	1
Clayoquot Sound, Van- couver Id.	12 0	12		Constitucion Cove, Bolivia	10 0	4	
Clear, Cape, Ireland -	4 0	9	6½	Conway Cape, Australia, E. Coast.	11 0	18	
Clearwater Point, Gulf St. Lawrence.	11 30	5	3	Cook Harb. Newfoundland	7 25		
Cleveland Bay, Aus- tralia, E. Coast.	7 30	10-12		Cooper Port, New Zealand.	3 50	7½	
Cley, England, N.E. Cst.		5½		Copiapo, Chile -	8 30	5	
Clifden Bay, Ireland, W. Coast.	4 30	13¼	10	Coquet Road, England -	3 0	14½	1
Clinch Fort, Fernandina, } United States - }	7 53	6¾	6¼	Coquimbo Bay, Chile -	9 8	5	
Clonakilty, Bay, Ireland	4 30	11	8½	Cordouan Lthse., France	3 37	13¾	10
Coacocho Bay, G. of St. Lawrence.	10 30	5	3	Corentyn River, Guayana	5 10	8½	
Cobija Bay, Bolivia -	9 54	4		Coringa or Cocanada Bay, Bay of Bengal, W. C.	9 10	4-5	
Cocagne River, G. St. Lawrence.	7 30?	4?	2?	Coringa R. (Bar), Bay of Bengal, W. Coast.	9 0	5	
Cochin Harb. and Road, Hindoostan, W. Coast.	1 0	3½		Corisco Bay (Elobey Isles), Africa, W. Cst.	5 0	7	
Cockburn Port, Africa, E. Coast.	4 15	12		Cork (Penrose Quay), Ireland.	4 58	12¾	10
Cockburn Sound, Aus- tralia, W. Coast.	9 0	1-1½		Corn Ids., B. of Honduras	1 45	2	
Cockenzie, Firth of Forth, Scotland.	2 16	15¾	13	Corner Inlet, S. Australia	11 40	8	
Cod Cape, United States	11 30	13		Cornwall, Cape, England	4 35	18?	13
Codroy Island, New- foundland.	9 15	6	4	Corpach (Loch Aber), Scotland.	5 59	11½	
Colarado River, La Plata	4 0	9	7½	Corran (Loch Aber), Scotland.	5 43	12	8
Colarados, R. La Plata -	3 40	11		Corunna, Spain -	3 0	15	
Cold Spring Inlet, United States.	7 32	5½	4¼	Coudres Id. (Prairie Bay), R. St. Lawrence.	4 25	17	10
Coleraine, Ireland -	6 24	6¼	4	Courseulles, France -	9 7	20	15
Collier Bay, Australia, N.W. Coast.	11 45	36		Courtmacsherry, Ireland	4 36	10¾	8
Colne Point, Colne River, England.	12 0	14	10	Coverack, England -	4 35	14½	11
Colombilla Cay, Pearl Cays, Caribbean Sea.	2 0	2		Cowes (West), England	{ 10 45 } 11 45	{ 12¼ } 12¼	{ 9 } 9
Colombo, Ceylon -	1 0	2		Coy Inlet, Patagonia, E.C.	9 30	40	
Colonsay, Scotland -				Coyhuin River, Chile -	0 52	21	
Columbia River, (entr.) America, N.W. Coast.	0 15	7½		Cozumel, B. of Honduras	8 30	1½	
Comoro Islands, (Jo- hanna I.) Indian Ocean.	3 30	8½		Crane Island, River St. Lawrence.	5 24	17	13
Comoro Islands, (May- otto L.), Indian Ocean.	4 10	11¾		Cranford Bay, Mulroy Bay, Ireland.	8 3	4	
				Crapaud, Prince Edward Island.	10 0	8	6
				Crimon Ids., Java Sea -	8 0	6	5
				Crinan, Scotland -	4 49	6½	5
				Croc Harbour, Newfound- land.	6 30?	4?	
				Croisilles Harbour, New Zealand.	9 0	12	8
				Cromarty, Scotland -	11 56	14	11

e.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
and -	7 0	14½	11	Delagoa Bay (Portu- guese Factory), Africa, S. Coast.	5 20	12	
Nova Scotia	8 0	6½	4½	Shefeen Id.,	4 40	12	
Bahamas -	7 0	2½		Africa, S. Coast.			
Ireland -	4 9	9½	8	Delaware (Breakwater), United States.	8 0	4½	3½
Patagonia,	12 0	6		Delftzyt, Germany -	11 15	8-10	
aint, River	1 45	19?	15?	Delgado C., Africa, E. C.	4 0	16	11½
ngland.				Delhi River, Sumatra -	4 0	8	
Ireland, W.	5 53	8½	6	Demerara R., Guayana -	4 45	9	6
assage Id.,	9 0	1		Denial Bay, Australia, S. Coast.	12 15	6	
Sea-				Denison Port, Australia, E. Coast.	9 30	6	
atagonia, W.		20		Desire Port, Patagonia, E. Coast.	12 10	18½	
, Galapagos	?	?		Devonport Dockyard, England,	5 43	15½	11½
asio, (Back-	11 55	45½	38	Dewghur Harbour, Hin- doostan, W. Coast.	11 25	9	
of Fundy.				Diamond Island, Bay of Bengal.	10 30	8	
Harbour,	12 6	6½		Point, Malacca	12 0	9½	
er, China				Straits.			
China, E. C.	8 0			Diego, San, Bay, Cali- fornia.	9 38	5	3½
ew Granada	3 30	13		Diego, San, Cape, Tierra del Fuego.	4 30	10	
chelles, In-	5 10	7		Garcia Island,	1 30	6	
				Indian Ocean.			
ustralia, E. C.	9 40	10-12		Ramirez Ids., Tierra del Fuego.	4 0	6	
ited States	7 40	4½	3½	Dielette, France -	6 40	27	20½
our, New-	7 0?	2 4?		Dieppe, France -	11 6	27	20½
ermany -	1 8	10		Digby Gut, B. of Fundy	11 0	27½	23
, California	9 25	5	4	Dingle, Ireland -	9 51	10½	7½
, New Zea-	11 30	8	6	Discovery Port, America, N. W. Coast.	2 30	7	
nce -	6 5	32	23½	Dislocation Harb., Tierra del Fuego.	1 40	4	
, China Sea,	11 0	5		Dia Island, Hindoostan, W. Coast.	2 0	6	
atagonia, W.	0 26			Dives, France -	9 39	21	16
arb., G. St.	3 10	9		Divy Pt., Bay of Bengal		5	
l, Ireland -	10 45	13	11	Doboy Lighthouse, U. S.	7 33	7½	7
, Madagascar	5 0	15		Dodandowe Bay, Ceylon	1 50	1½	
.. Tasmania	12 5	10	7	Dodo River, Bight of Benin.	4 17	5	
Hindoostan,	1 30	17		Domingo, San, Port, Pa- tagonia, W. Coast.	12 0	7	
it, Moluccas		11		Donaghadee, Ireland -	11 13	11½	9
Hindoostan,	1 30	17		Donegal Harb., Ireland -	5 18	11½	8½
Forres Strait	9 30	12		Doris Cove, Tierra del Fuego.	3 0	4	
ngland -	6 16	14½	10½	Dornock Road, Scotland	11 47	11	
hoiseul Id.,	6 30	5½		Douglas, Isle of Man -	11 12	20½	16
lands.				Road, Bahamas -	8 30	4	2½
, Australia,	5 30	17-24		Dover, England -	11 12	18½	15
, Madagascar	4 30	7		Downham Beach, Orwell, England.	12 27	12	
North Sea	12 30	12	8				
l -	11 15	16	12½				
urian Strait	5 0	10					
Orkneys -	10 30	10	7½				
(Port Mel- ca, S. Coast.	4 30	15					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Ri Spring.
		Springs.	Neaps.			
	h. m.	ft.	ft.		h. m.	ft.
Dragons Mouth, Carib- bean Sea.	3 0	4		Elliot Port, Australia, S.C.		5-6
Drayton Harb., St. Juan de Fuca Strait.	2 0	12		Emden, Germany -	12 0	
Drogheda (Bar), Ireland	11 0	11½	9	Ems River, (outer buoy), Germany.	10 0	8-10
Duart, Isle of Mull -	5 0	12	10	Encounter Rock, Yellow Sea.	10 30	10
Dublin (Bar), Ireland -	11 12	12-14	9-11	Endeavour R., Australia, N. Coast.	8 0	5-10
Dumbarton, Scotland -	0 20	9		—— Strait, Aus- tralia N. Coast.	1 0	9½
Dunbar, Scotland	2 8	14½	11	Endermo Harbour, Japan	5 30	6
—— Hindoostan, W. Coast.	10 10	8		English Bank, San Carlos, Patagonia, W. Coast.	0 4	
Dunbeacon, Ireland -	3 51	10½	7½	English Harbour, Antigua		2
Duncansby Ness, Scot- land.	10 14	10	7	English R., Delagoa Bay, Africa, S. Coast.	7 30	5
Dundalk, Ireland -	10 56	13½	11½	Enora Bay, Japan Sea -		4
Dundee, Scotland -	2 32	14½	11½	Eran Bay, (Palawan)	10 10	6½
Dungeness, England -	10 45	21½	19	China Sea, E. Coast.		
Dunk Island, Australia, E. Coast.	9 28	6-10		Erebus Bay, Barrow Strt.	12 6	8
Dunkerque, France -	12 8	16½	13½	Erme River, Bigbury Bay, England.	5 40	16½
Dunkerron, Kenmare R., Ireland.	3 45	10½	8	Erqui, France - -	5 59	33½
Dunmanus Harb., Ireland	3 57	9½	7½	Erronau or Futuna, S. Pacific.	7 24	4
Dunmore, Ireland -	5 27	12½	9½	Escumenac, Pt., Gulf St. Lawrence.	4 10	4
Durnford Port, Africa, E. Coast.	4 45	12		Espirito Bay, Brazil -	3 0	4
Dusky Bay, New Zealand	11 15	10	8	Espirito Santo, C., Ma- gellan Strait.	8 30	36-42
Dvina (Bar), White Sea		3½		Esquimalt, St. Juan de Fuca Strait.*	irr.	7-10
Dyer Id., Africa, S. Cst.	2 50	5		Essington Port, Australia, N. Coast.	3 24	13
Easdale Sound, Scotland	5 10	10-12		Estevan, San, Port, Pata- gonia, W. Coast.	0 15	5
Easter Id., South Pacific	2 0			Etches Port, America, N.W. Coast.	1 15	9½
East Cape, New Zealand	8 55	7		Evangelists, Patagonia, W. Coast.	1 0	5
—— Point, Prince Edward Island.	8 30	3½	2	Exmouth, England -	6 21	12½
Ecrehou, France -	6 32	31	22½	Exuma, Bahamas -	7 20	2½
Eddystone Pt., Australia, E. Coast.	9 39	7		Eyemouth, Scotland -	2 15	15½
Eden Harbour, Patagonia, W. Coast.	12 30	5		Eyre Port, Australia S. C.	10 30	6
Edgar Port Falkland Is.	7 15	6		Fair Isle, Shetlands -	11 0	5
Edgartown, United States	12 16	2½	2	Fairy Port, Australia, S.C.		4
Edina, Africa, W. Coast	5 50	4		Falkland Sound (N. en- trance), Falkland Ids.	6 45	
Edmonstone, Id., Sherbro River, Africa.			8	—— (S. entrance)	7 0	
Egg Id. Lt., United States	9 4	7	5½	Fall Harbour, Labrador -	6 40	3½
—— G. St. Lawrence	2 0	11	6	Falmouth, England -	4 57	16
Egmont Bay, Prince Edward Island.	3 0	4	2	False Point, Bay of Bengal, W. Coast.	8 0	8
—— Port, Falkland Islands.	7 30	11		Famine Port, Magellan Strait.	12 0	6
Eides Fiord, Færoe Ids.	11 0	9½	7½	Fane Id., Plumper Sound, Oregon.	irr.	12
Elbe, Entrance, Germany	12 0	11		Fannings Id., S. Pacific -		4
Elena Sta., Port, Pata- gonia, E. Coast.	4 0	17		Fanny Hole, Mulroy Bay, Ireland.	6 17	9½
—— Bay, Ecuador -	1 18	8				
Elizabeth Bay, Africa, S. W. Coast.		5-6				
Ellen Port, Islay -	5 0	5	4			
Ellenwoods Anchorage, Bay of Fundy.	9 54	13	10½			

* May to October from Midnight to 3 am. November to April from Noon to 3 pm.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Channel, Canton	1 0	7½	5	Formosa Mt., Malacca Strt.	8 0	11	8½
a, E. Coast				Fort Dauphin, St. Domingo	7 0	5½	3½
South, California	10 37	4½	3½	Fortune Bay, Patagonia,	0 50	7	
(close to the	11 48	11½	8½	W. Coast.			
Quay), England.				Foulness, Crouch River,	12 5	14½	10½
Bridge, Eng-	11 51	7½	4¾	England.			
Cape, New	9 20	14	10	Fowey, England - -	5 14	15	11¾
apan Sea -	6 0	5		Fowlers B., Australia, S.C.	10 30	6	
cores, Atlantic	11 45	4		Fox Bay, Falkland Ida. -	7 0	6	
Cape, River,	7 19	5½	4¾	Foyle Lough (Warren-	6 20	6½	5
States.				point), Ireland.			
France -	10 44	23½	18	Foynes Island, Ireland -	5 35	15½	12
lee Bay, Ireland	4 3	12½	9½	France, Port de, New	8 25	4	
ry, Jura -	4 41	6½	4½	Caledonia.			
a, Clinch Fort,	7 53	6½	6½	Francis, St., Bay, Tierra	4 0		
States.				del Fuego.			
Noronha Island,	4 0	6		Francisco, San (North	12 6	4½	3½
ctic.				Beach), California.			
Po, Bight of	4 0	7		Fraser River (entrance),	6 30	7-10	
ary Ids. -	12 30?	9?		America, N. W. Coast.			
ain - -	3 0	15		Fraserburgh, Scotland -	0 40	11	8½
, England -	4 20	16	12½	Frechette Id., River St.	8 0	14	9
, Cape, Spain -	3 0			Lawrence.			
G. Manan, Bay	11 16	22½	18½	Frederick Reef, Aus-	8 0	6	
y.				tralia, E. Coast.			
, Wales -	6 56	11½	8½	Frederickshaab, Green-	6 3	12½	9½
Id., Australia,	9 15	7-12		land.			
t.				Friederichstadt, Denmark	2 37	9	
ort, Falkland I.	4 45	6		Frio Porto, Brazil -	2 40	4½	
ay, St. Domingo	irr.	2-3?		Froward Cape, Magellan	1 0		
igh Hd., England	4 30	16	12	Strait.			
Port, Chile -	9 10	5		Fugloe Fiord, Faroe Ids.	11 15	6½	4½
Ids., Bristol	6 54	37?	28?	Funchal Bay, Madeira -	12 48	7	
L.				Funk Id., Newfoundland	7 0?	2-3?	
. Port, England	11 12	26½	19¾	Fury Cove, Patagonia, W.C.	1 15		
yre Light -	11 11	27	20½	— Harbour. Tierra del	2 30	4	
y, or Bay St.	3 30?	6?		Fuego.			
frica, S. Coast.				Fury Id., Tierra del Fuego	2 30	4	
is Harb., New-	7 15	2-4		Fury and Hecla Strait,	7 0	8	
nd.				Arctic Regions.			
roup, Australia,	9 15	8-12		Gaboon R., Africa, W.C.	5 30	3	
st.				Galang Bay, Hainan Id.,		4-5	
Cape, United	8 34	1¾	1½	China Sea.			
Belgium - -	1 20	15		Gallant Port, Magellan Str.	9 0	5½	
Hang-chu B.,	11 45	17		Galle, Pointe de, Ceylon,	2 0	2	
E. Coast.				S. Coast.			
Newfoundland	7 20	4		Gallegos Port, Patagonia,	8 50	46	
, England -	11 7	20	16½	E. Coast.			
nt, Petitcoudiac	11 49	45	38	Gallinas R., Africa, W. C.	6 45	4	
B. of Fundy.				Galloway (Mull of) -	11 15	15?	12?
ag Group (Bul-	8 30	17		Galway, Ireland - -	4 35	14¾	11
urb.) China W.C.				Galveston, G. of Mexico		1¾	¾
River, Bight of	4 22	5		Gambia R., Africa, W.C.	8 10	6-9	
h R., Africa, W.C.	7 40	11		Gambier Ids., Australia,	1 50	3	
oint, England -	10 35	28		S. Coast.			
				Garliestown, Scotland,		17	12
				W. Coast.			
				Garroch Head - -	11 49	10	
				Gaspé Basin, Gulf St.	2 40	5	3
				Lawrence.			
				Gay Head, United States	7 37	7	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Geby, Fohou Id., Gilolo Passage, Moluccas.		5		Good Success Bay, Tierra del Fuego.	4 3	6-8	
Geelong Harbour, Australia, S. Coast.	2 50	2½		Goold Island, Australia, E. Coast.	6 45	6	
George Cape, Nova Scotia	9 15	4	2	Gooriya Creek (entrance), Hindoostan, W. Coast.	11 0	9	
George d'Elmina, St. Africa, W. Coast.	4 30	6		Goose Cove, Newfoundland.	7 0?	2-3?	
—— Port, B. of Fundy	11 17	32	28	Gorda Sound, Virgin Ids.	8 30	1½	
—— St., Basin, Australia, N. W. Coast.	12 15	25		Gore Port, New Zealand	9 0	8	6
—— Shoals, United States.	10 30	7		Goree Road, Tierra del Fuego.	4 0	8	
Georges, St., Sound, G. of Mexico, Mid entrance.	1 31	1½	1½	Goulburn Ids., Australia, N. Coast.	6 0		
—— West entrance	irr.	2½-4		Goury, France - -	7 6	22	17½
Georgetown, United States	8 40	4½	3½	Gowlland Harbour, Discovery Passage, Vancouver Id.	5 30	11	
—— South Island, United States.	7 56	4½	3½	Gracias, Cape, Harbour, Bay of Honduras.	10 30	2	
Geriah Harbour, Hindoostan, W. Coast.	2 40	9		Grand Cestos, Africa, W. Coast.	5 20	4	
Germain St., France -	6 20	34	25	—— Harb., Gd. Manan, Bay of Fundy.	11 7	21	17½
Ghubbet Ne, Socotra, Indian Ocean.	7 0	7		—— Lahou, Africa, W. Coast.	4 20	4	
—— Hashish, Arabia, S.E. Coast.	10 0	10		Grand Passage, B. of Fundy.	10 43	20½	17
Gibraltar, Spain - -	2 20	3½		Grand Port, Mauritius -	1 0	1½	
Gigha Sound, Scotland -	2 22	4	2½	—— Rustico, Prince Edward Island.	6 40	4	2
Gijon Bay, Spain, N. Cst.	3 15	15		Grande-digue, Madame I., Cape Breton Id.	7 55	6½	4½
Gilmorris Id., Africa, W. Coast.	6 0	11		Grande Point, Chile -	9 45	5	
Gizree Bunder, Indus, Hindoostan, W. Coast.	9 50	7		Granton Pier, Scotland -	2 20	16	12½
Glasgow, Scotland - -	1 25	9	7½	Granville, France -	6 13	37	27½
—— Port, Scotland -	0 18	9		Gravelines, France -	12 0	19	15
Glenan Iles, France -	3 12	13	10	Graves Port, Howe Sound, Gulf of Georgia,*	noon	12	
Glennie Ids., Bass Strait	12 20			America, N. W. Coast.			
Gloucester Cape, Tierra del Fuego.	1 30	5		Gravesend, England -	1 10	17½	14
—— Harbour, United States.	11 4	10½	8½	Great Barrier, Id. (Nagle Cove), New Zealand.	6 25	10	7
Gluckstadt, Germany -	3 9	10		Great Barrier Reef, Australia, E. Coast.	8 48	7	
Goa, Hindoostan, W.C. -	11 30	6		Great Fish Bay, Africa, W. Coast.	2 30	5-6?	
Godbout River, Gulf St. Lawrence.	1 52	11	6	Great St. Lawrence Harb., Newfoundland.	8 30	7	4
Goeree (West Gat) -	1 45	7		Greatman Bay, Ireland	4 39	15½	11
Gollonsir Socotra, Ind. Ocean.	7 20	8		Green Island, River, St. Lawrence.	2 45	16	9
Golovnin Bay, America, N. W. Coast.	6 23	3½		Greencastle Point, Ireland.	11 2	14	11
Gomera, Canary Ids. -	12 45?	9?		Greenock, Scotland -	12 8	9½	8
Gometra, Loch Tuadh, I. of Mull.	5 29	11½	8	Greenwich, England -	1 43	19	15
Gonaives Bay, St. Domingo	8 0	1		Gregory Bay, Magellan Strait.	9 45	23	
Goods Bay, Patagonia, W. Coast.	0 30	7		Grenada (St. George Harb.), Caribbee Ids.	2 40	1½	
Good Hope, Cape of, China, E. Coast.	9 0						
Good News B., America, N. W. Coast.	6 15	13½					

* From observations made in the month of October.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
adinea, Caribbee Ids	3 0	1½	1	Harbour of Mercy, Magellan Strait.	1 22	4	
Port, Swan River, Australia, W. Coast	9 0	1-1½		Harbour Grace, Newfoundland.	7 30?	7?	
town, Mosquito Cst.	9 0	1½		Harbour Id., Nova Scotia	7 40	6½	4½
unika Pt. White Sea	4 50	3		Hardy Port, New Zealand	9 55	8	6
th I., Barrow Strait	12 15	3½	2½	Harrington Port, England	11 5	■	19
et Bays, Newfoundland.	7 0?	2-3?		Hartlepool, England	3 28	15	11½
usby, England	5 36	19½	15	Harwich, England	12 6	11½	9½
latone Island, Bay of ndy.	11 47	41	34½	Hastings, England	10 53	24	17½
es Cape, France	11 27	21½	16½	Harbour, Bay of Bengal, E. Coast.	10 40	13½	
dine, R. St. Lawrence	9 0	9	6	Hatteras Inlet, United S.	7 4	2½	2
nbacho Bay, Peru	6 30	2		Haute Isle, Bay of Fundy	11 21	33	28½
ney Bay, Peru	6 10	2		Havana, Cuba		3	
nico, Mexico, W. C.	1 30	5		Haverfordwest, Wales	6 42	7½	2½
naquil, Ecuador	7 0	11		Håvre, France	9 51	22	18
mas, Mexico, W. C.	8 0	4		Hawke B., New Zealand	7 50	3	
nsey. (St. Peter rt.) English Channel.	6 37	26	18½	Héaux Lights, France	5 45	31	23½
Narrows, Patagonia, . Coast.	2 10			Heavandou Pholo Atoll, Maldives.	9 30	5	
chos Kay, Bahamas	7 40	3		Heda Bay, Japan Sea		5½	
Cay, Bahamas	8 30	3		Helena St., Bay, Africa, W. Coast.	2 30		
Lavee R (entrance), ndoostan, W. Coast.	2 0	19		Id., S. Atlantic	3 11	3	
leet Sand, England	11 40	12	8	St. Sound, U. S.	7 8	7½	6
laff Id., China, E. C.	11 30	15		Helford, England	4 43	15½	11½
borough, Nova otia.	8 20	6½	4½	Helgoland, German Ocean	11 33	9½	7
edore (Banbeg), Ire- id.	5 32	11	8	Helier, St., Jersey, English Channel.	6 25	30½	21½
tem, Netherlands	9 0			Hell Gate Approaches, United States.			
table Id., Lapland	7 9	9		Long Id., (Blackwells Dock).	9 59	6	5½
cants Harb., C. Bre- on, Id.	8 20	6½	4½	N. of Astoria Ferry.	9 48	6½	5½
an Bay, China, E. ast.	9 0			Pot Cove, (S. E. part).	10 48	8½	6½
i Cape, St. Domingo	6 0	3		Wards Id., (Paupers Dock).	10 9	6½	5
un-tau, (Thornton even), Yellow Sea.	9 0	12		Hellevoetsluis, Nether- lands.	2 30	8	6
lnyt Head, Nova mbia.	1 30	4		Henlopen Cape, United States.	8 0	4½	
odadi Harb., Yezo land, Japan.	5 0	■		Henry Cape, United States	7 40	4	
fax, Nova Scotia	7 49	6	5	Henry Port, Patagonia, W. Coast.	12 0	5	
Bay, Patagonia, W. ast.	0 30	8		Heron Islet, Capricorn Group, Australia, E. C.	9 0	10	
burg, Germany	5 29	6½		Herradura Port, Chile	9 8	5	
ilton Port (Korea), llow Sea.	8 30	11		Nicoya Gulf	3 9	10	
merfest, Norway	1 10	9		Hewett Bay, Tierra del Fuego.	0 30	6½	
mond Knoll, Eng- id. E. Coast.	7 40			Heybridge, Blackwater, River, England.	12 20	12	8
g-chu Bay (Sesham a.), China, E. Coast.	11 45	14		Hie-chechin Bay, China, E. Coast.	7 0		
—(Fog Ids.)	11 45	17		Hicks Bay, New Zealand	9 0	7	
—(Chapoo Rd.)	12 0	25		Hierling, Jutland	2 45	5	
—off Can-pu		32		Higbee, Cape May, United States.	8 33	6½	5½
ver Sound, Bahamas	8 15	4	3				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neaps.			Spring.	N
Hillsborough Bay, Prince Edward Id.	h. m. 10 45	ft. 9½	ft. 7	Hulushan B., Yellow Sea	h. m. 11 00	ft. 8	
Island (New Port), Bonin Islands.	11 32	3½		Humboldt Bay, California	12 2	5½	
Hillswick Firth, Shetland	9 45	6½	5	Hunter Id., Bass Strait	11 30	8	
Hilton Head, United States	7 19	7½	6½	—Port, Australia, E. Coast.	9 45	6-7	
Hirtshals, Jutland	4 28	1		Hurst (Camber), England	{ 10 0 12 0 }	7½	
Hobartown, Tasmania	8 15	4½	3½	Husum, Denmark	2 36	9	
Hoe-e-tow Bay, China, E. Coast.	12 15	16		Hyanais, United States	12 22	4	
Hokianga R. (entrance), New Zealand.	9 45	10		Ichabo Id., Africa, W. C.	1 0	6	
Hokianga R. (Kokohu) New Zealand.	10 15	10	7	Ilfracombe, England	5 42	27½	1
Hollesley, England	11 30	8½	6½	Ilha Grande, Brazil	12 30	5	
Holmes Hole, United States.	11 43	1½	1½	Ilheo, Port d', Africa, W. Coast.	3 0	8-10	
Holsteinborg, Greenland	6 30	10		Iloilo Port, Filipinas	12 0	5½	
Holy Island, England	2 30	15	11½	Inagua, Bahamas	8 0	3½	
Holyhead, Wales	10 11	16	12½	Indefatigable Id., Galapagos.	1 56	6	
Hon-cohe Bay, China Sea, W. Coast.	11 30	5		Indian Cay, Florida	11 00	2½	
Hondenklip Bay, Africa, S.W. Coast.	2 30	5½		Indus (Gizree Bunder), Hindoostan, W. Coast.	9 50	7	
Honfleur, France	9 29	23½	18	Inhambane R., Africa, E. C.	4 15	10	
Honghai B., China, E. C.	10 0	6½		Inishbofin, Ireland	4 34	12½	
Honoruru, Sandwich Ids.	4 0	2		Inishkeel, Ireland	5 10	11	
Hongkong, China, E. C.	10 15	4½		Inishturk, Ireland, W. Coast.	4 36	12½	
Hoogly R. (W. entrance), Bay of Bengal, W. C.	10 0	10½		Inkanakie, White Sea	9 15	11	
Hope Harb., Falkland Ids.	8 10	7		Inman Cape, Tierra del Fuego.	2 0	4	
Horn Cape, Tierra del Fuego.	4 40	9		Intsi Point, White Sea	11 55	12	
Horn or Blaavand Point, Jutland.	1 44	8		Inverary, Scotland	12 0	10	
Horton Bluff, B. of Fundy	12 30	48	40	Inverness, Scotland	12 18	11	
Hougue Ia, France	8 42	18½	14½	Investigator Rd., Australia, N. Coast.	8 0	9	
Hourdel, France	11 26	27½	21	Iona Sound, Scotland	5 11	11½	
Hout B., Africa, W. Cst.	2 20	5		Ipswich, England	12 35	13½	
Houtman Rocks, Australia, N.W. Coast.	11 30	2½		United States	11 26	10½	
Howden, R. Tyne, England.		12		Iquique Road, Peru	8 45	5	
Howe, West Cape, Australia, S. Coast.	9 0	6		Ireland Id., Bermudas	7 4	4	
Howth Harbour Ireland	11 9	13	10	Isidro St., Cape, Magellan Strait	1 0	6	
Huacho Bay, Peru	4 45	3		Island Harbour, Choiseul Id., Falkland Islands.	5 20	6	
Huaso Islands Patagonia, W. Coast.	12 0	7		Islay, Peru	8 53	7	
Huapilinao Hd., Patagonia, W. Coast.	1 25	15½		Isle-aux-Coudres, R. St. Lawrence.	4 25	17	10
Huasco Port, Chile	8 30	6	4	Isles de Los, Africa, W. C.	6 35	11	
Huillard Inlet, Patagonia, W. Coast.	0 48	16-20		Islette Cape, Arabia, S.E. Coast.	9 0	10	
Hu-i-tan Bay, China, E. Coast.	12 15	16		Ives, St., England	4 44	21	15
Hukkar R. (entrance), Hindoostan, W. Coast.	10 30	11		Jacinto, Port San, Ticao Id. Filipinas.	6 30	6	
Hull, England	6 29	20½	16½	Jackson Port (N. Head), Australia.	8 15		
— Bridge, Crouch R., England.	12 25	11	11	Jacmel, St. Domingo	irr.	2-37	
				Jaffrabat, Hindoostan, W. Coast.	11 35	9	7½
				James Id. (Adam Cove), Galapagos.	2 14	5	
				— N. side, Galapagos.	2 34	5	

ce.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
V. end, Gal-	3 10	5		Jura Island, (Small	5 3	3½	2½
tyPoint)U.S.	2 11	3	2¾	Isles), Scotland.	4 41	6½	4½
al, Persian	9 30	8		—Feolin Ferry „	5 30	8	6
Persian Gulf	6 0	6		Kaikora Penin, New Zea-			
y of Fundy-	10 4	15	11¾	land.			
a Scotia -	7 45	6½	4½	Kaipara Harb. (entrance),	10 55	10	8
ds., Lapland	6 23	10		New Zealand.			
terranean -	3 10	7	5	Kalgalska, White Sea	6 50	7	
, Brazil -	11 30	12		Kalian Point, Banka Strait	8 17*	12½	
elier), English	6 25	30½	21¾	Kandalaksha, White Sea	3 25	7	
annel.				Kanushin Cape, White Sea	11 54	15	
sel) -	6 15	30	21½	Kapiti Island, New Zealand	9 0	6	
Australia, E.	6 20	6-9		Karachi Harb. (entrance)	10 30	9½	6
				Hindoostan, W. Coast.			
bí, Persian G.	6 30?			Karakoa Bay, Owyhee -	3 49		
mar-al-nafur,	9 30	10		Kata, Japan Sea -	6 4	6½	
ia, S.E. Coast.				Katwyk, Netherlands -	2 30	5	7
Persian Gulf	11 30	10		Kawau Id., New Zealand	6 30	10	
r „ -		8½		Kawhia Harb., New Zea-	9 30	12	
s „ -	0 45	7½		land.			
rg or Káreg „	8 0	6½		Kedewarry, Hindoostan	9 57	9	
ek „ -	10 15			Keelacarry, Ceylon -	11 0		
nb „ -		8		Kedgerree, Bay of Bengal	11 30		
l Sea -		3		Keeling Islands (Port	5 30	5	
, White Sea -	5 15	4		Refuge), Indian Ocean.			
Brazil -	6 24	14	10½	Kegashka B., G. St. Law-	10 45	5	3
, Comoro Ids.,	3 30	8½		rence.			
que.				Kelung Harb. (Formosa),	10 30	3	
ay of Fundy -	11 21	27	23	China Sea, E. Coast.			
Newfoundland	7 30	6	4	Kenmare R. (W. Cove),	3 52	10	7½
river, Africa,	4 0	5		Ireland.			
				Kenn Reef, Australia, E.	8 0	5½	
iver, U. S. -	7 28	5½	5	Coast.			
Bay, Gulf of	10 0	6		Kennebec River (Hanni-	11 15	9½	8
				wells Point), U.S.			
, Africa, W.C.	8 10	6		Kent Island, Bass Strait	11 10		
doostan, W.C.	2 0	16	12½	Kentish Knock, England	11 47		
Port, Patagonia,	10 0	30	25	Keppel Bay, Australia, E.	9 30	9-14	
				Coast.			
Island, New	9 30	6	3	Keret, White Sea -	3 8	6	
sk.				—Point, White Sea	4 30	5½	
ra, Madagascar		5		Kerguelen Island, Indian	2 0	2	
andez I., Chile	9 30	4		Ocean.			
Porto Rico -	8 2	1½		Kesm, Persian Gulf -	11 0	12	
Port, Peru -	5 10	3		Kettle Cove, United States	7 48	5	4½
Africa -		8		Khór Jerámeh, Arabia,	9 30	10	
t, United States	7 32	3¾	3½	S.E. Coast.			
Lapland -	9 0	13		Kijouk Phyou Harbour,	10 0	9	6
, Port, Pata-	10 45	30		Bay of Bengal.			
Coast.				Kilbaha, Ireland -	4 16	13	9½
b, Greenland -	5 6	7	5	Kilda, St., Hebrides -	5 30		
t, Harbour, }	7 21 A.M.	4½	3	Kildin Id., Lapland -	6 45	12	
idland. }	6 30 P.M.			Kilkieran Cove, Ireland -	4 34	15½	11
entrance, Can-	11 50	6½		Killala Bay, Ireland -	5 22	10½	8
r, China.				Killeany Bay, Arran Ids.,	4 28	13½	10
r, Africa, W. C.	5 45	5		Ireland.			
Id. (E. Side),	10 0	11½		Killingholme (Humber	6 2	19½	15½
Strait.				R.), England.			
				Killybegs, Ireland -	5 16	11½	8½
				Killyleagh, Ireland -	12 40	11	9½

* In N.W. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	N
	h. m.	ft.	ft.		h. m.	ft.	
Kilmichael Point, Ireland	8 30	4½	3	Lagos River (Consulate Wharf.)		2	
Kilrush, Ireland -	4 42	14	10½	——— (Palaver Ids.)		1	
Kincardine, Firth of Forth, Scotland.	2 53	17½	15	Laguimanoc Port, Luzon	1 30	5½	
King Id., Bass Strait -	1 0			Laguna de Terminos, G. of Mexico.	noon.	1½	
King Port, Falkland Ids.	7 30	5		Lamalin, Newfoundland	9 15	8½	
Kingsbridge, England -	5 46	10		Lambayeque Rd., Peru -	4 0	3	
Kingstown, Ireland -	11 10	11	8¾	Lamlash, Scotland -	11 49	10	
Kinsale, Ireland -	4 43	11½	9	Lamo Harb., Africa, E. Coast.	4 6	11	
Kinsiang Point, China, E. Coast.	7 0			Lancaster, England -	11 16	8½	
Kircubbin, Ireland -	12 42	11½	9½	Landshipping, Cleddau River, Wales.	6 27	20	1
Kirindi, Ceylon -	3 30			Langshan Crossing, Yang-tse-Kiang.*	1 40	12	
Kirkcudbright, Scotland	11 10	23		Lankeet Island, Canton River, China.	11 20	6½	
Kirkwall, Orkneys -	10 9	10	7½	Lansew Bay, China, E.C.	10 0	13	
Kishm, see Kesm.				Lanzarote, Canary Ids. -	1 0?	9?	
Kitnapatnam, Bay of Bengal, W. Coast.	11 0	1½		Laredo B, Magellan Strt.	11 30	9	
Knox Bay, America, N. W. Coast.		11		Larga, Scotland -	11 50	10	
Koepang, Timor - -	11 0	9	6½	Latham Id., Africa, E. Cst.	4 0	10	
Kokohu, New Zealand -	10 15	10	7	Latitude Bay, Tierra del Fuego.	2 5	4	
Ko-kun-to Group, Korea, W. C.	2 25	18	10	Laun, Great and Little, Newfoundland.	8 15	7	
Kok-si-kon Prt. (Formosa) China Sea, E. Coast.	11 30	3		Laura Harb., Tierra del Fuego.	1 0	6	
Koombanah B., Australia, W. Coast.	9 0	½-3		Lavata Cove, Chile -	9 20	5	
Koree R. (Monda Point), Hindoostan, W. Coast.	11 40	11		Lawrence, Great St., Harb. Newfoundland.	8 30	7	4
Kouloi River - -	1 15	20		Le Have Cape, Nova Scotia.	7 48	7	1
Kou Zomen, White Sea -	3 30	6		——— Nova Scotia, Crooked Channel.	7 51	7½	1
Kovda Bay, White Sea -	3 25	6		——— Mothers Island	7 51	7	5
Koweit, Persian Gulf -	0 15	9		——— Getsons Cove	7 55	7½	6
Krakatoa, Strait of Sunda	7 0	4		——— Bridgewater (McKean's Wharf.)	8 6	8	6
Kuper Port, America, N. W. Coast.	1 40	13	10½	——— Lunenburg (Spidlers Cove.)	7 54	7½	6
Kuriyán Muriyán Bay and Islands, Arabia, S.E. Coast.	8 20	6½		Le Maire Strait, Tierra del Fuego.	4 0	7	
Kurrachee, see Karachi.				Leervig Fiord, Færø Ids.	0 30	6½	4
Kweshan Ids., China, E. Coast.	9 30	14		Leith, Scotland - -	2 17	16½	12
Kyem River, White Sea	5 23	4		Leman Shoal, England, E. Coast.	6 0		
Kykduin, Netherlands -	7 0	12		Lennox Cove, Tierra del Fuego.	4 40	8	
Kyle Akin, Loch Alsh, Scotland.	6 16	15½	11	Leopold Port, Barrow Strt.	12 6	6	4
Kyle Rhea, Scotland -	6 0	15	11	Lepreau, Bay of Fundy -	11 18	24½	21
La Poile Bay, Newfoundland.	9 0	6	4	Lerwick, Shetland -	10 30	6	4
Labuan Id., China Sea, E. Coast.	9 45	6		L'Etang Harb., Bay of Fundy.	11 19	23½	20
Labyrinth Ids., Magellan Strait.	0 30	5½		Leubu River, Chile -	10 30	5	
Lacul Harb., St. Domingo	6 0?	3?		Leven Port, Madagascar	3 30	7½	
Lady Bay, Australia, S.C.		4		Levrier Bay Africa, W. Coast.	12 0	6-7	
Lady Elliot Islet, Australia, E. Coast.	9 0	7-8		Lewis Cape, St. Labrador	6 30		
Lagos, Portugal -	2 7	13					
——— River (Bar), Bight of Benin.	6 0	3					

* At the Langshan Crossing the tide rises for 3 hours only, and falls for 9 hours.—H.M.S. Actæon, 1861.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Cape (G. of Siam), na Sea, W. Coast.	5 7	6½		Loch Eil (Head of Loch)	6 27		
Ho (Bar), Yellow Sea.	4 0	11		— Eport „ -	6 6	12½	9½
— (entrance) -	5 0	12		— Eriboll „ -	7 43	14½	11
ung Gulf (Sand at), Yellow Sea.	4 50	7	5¾	— Erisort „ -	6 43	15½	11½
— N.W. Head of f.	5 30	10	8¾	— Etive, Stonefield „	7 3		
ick, Ireland -	6 16	18¾	13¾	— Bunawe „	7 54	5¾	
River (entrance),	4 15	12		— Ewe „ -	6 39	14½	10½
ica, E. Coast.				— Goil „ -	12 6	10	6
a, Persian Gulf -	12 0?			— Hourn „ -	5 45	13¾	10½
Island, Canton R.	12 0	7½		— Inver „ -	6 41	14	11
na, E. Coast.				— Laxford „ -	6 44	15	11½
(Belem), Portugal	2 30	12	9	— Linnhe „ -	5 26	12½	8½
or Bay, Ireland -	4 23	13¾	10	— Long „ -	12 6	12	
ab Harb., Nova	8 0	6½	4½	— Maddy „ -	6 6	12½	9½
ia.				— Moidart „ -	5 44	13½	9½
Bay, China, E. C.	10 15	16		— Nevis „ -	5 47	14½	10
enmark -	2 21	6		— Roag „ -	6 11	11	8
Ridge, White Sea -	11 45	15		— Ryan „ -	11 12	11	
Egg Harbour, }	7 10	4½	3½	— Strivan „ -	11 55	6	
ted States - }				— Sunart „ -			
Fish Bay, Africa,	2 30	5-6?		— Tarbert, West, Har-	6 4	11½	8½
Coast.				ris Island, Scotland.			
Gull Island, U. S. -	9 38	3	2¾	— Tarbert, East, Scot-	6 10	13½	10
ampton, England	11 36	16	11½	land.			
Metis, G. St. Law-	2 10	13	8	— Tongue „ -	7 53	15	12
e.				— Torridon „ -	6 20	15	11
Milford Quay,	6 31	19	13½	— Tuadh „ -	5 29	11½	8
r Cleddau, Wales.				Lofoten Ids., Norway -	12 0	9	7½
Natashquan, G.	11 0	5	3	Loheia, Red Sea -	1 30	3	
Lawrence.				Loire R. (St. Nazaire),	3 40	15½	11
ool, England -	11 23	26	20½	France.			
— Bay, Nova	7 50	8	5	Lomas Point, Peru -	8 19	5	
ia.				Lombock, (AmpanamB.),	8 0	6	
ay, Lapland -	5 58	9		Java Sea -			
Id., Australia, E.	9 15	7-10		London Bridge, England	2 7	19½	16½
t.				— Docks, England	1 57	19½	17
Point, (Perran	5 0	14½	10½	Londonderry, Ireland -	8 1	7½	5½
e Cove), England.				Looe (East), England -	5 26	16	13
y (Bar), Wales -	6 16	28	21	Lookout Point, United S.	0 58	2	1½
Port, Bonin Ids. -	6 8	3		Lopez Cape, Africa -	4 30	4-6?	
, San Paul de,	4 30	5		L'Orient (Port Louis),	3 11	13	9½
a, W. Coast.				France.			
Point, Banka Strt.*	11 0†	10		Lord Howe Island, S.	8 30	6	
B., Africa, S.W.	2 20	5		Pacific.			
t.				Lo-shan-kan, Yellow Sea	4 30	11	9
oint, Peru -	8 0			Lough Larne, Ireland -	10 48	6¾	6½
ay, Bahamas -	7 40	3		— Rossmore, Ireland	5 20	11	8
Head, Patagonia,	0 29			Louis Port, France -	3 11	13	9½
Coast.				— Mauritius -	12 30	3	2½
line, Scotland -	5 33	13¾	10½	Louis, St., Bay, St. Do-	irr.	2-3?	
ish „ -	6 16	15½	11	mingo.			
isdale „ -	5 47	12¾	9½	Louisburg Harb., Cape	8 0	5	4
oom „ -	6 40	14½	10½	Breton Id.			
rron „ -	6 29	16½	11½	Low Bay, Falkland Ids.	5 0	5½	
rich „ -	6 0	15½	11	— Port, Patagonia, W.	0 40	7	
invegan „ -	6 7	15½	11	Coast.			
				Lowestoft, England -	9 57	6½	5½
				Luabo River (entrance),		22	
				Africa, E. Coast.			
				Lucas San, Bay, California	9 20	9½	

* In S.E. monsoon.

N

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Ri Springs
		Springs.	Neaps.			
Lucipara Pass, Banka Strait.	h. m. irr.	ft. 10	ft. 7½	Malacca Strait (off Mount Formosa).	h. m. 8 0	ft. 11
Luis St., Texas, G. of Mexico.		1½	¾	—— Road, Malacca St.	7 30	11
Luis Obispo, San, California	10 8	4½	3½	Malaga, Spain - -	12 0	3
Lunaire Bay, Newfoundland.	7 0?	2-3?		Malahide Inlet, Ireland	11 15	10
Lundy Island, England -	5 15	27	20	Malcolm Atoll, Maldives	10 30	3
Lung-mun Harbour, Yellow Sea.	10 0	7		Maldon, Chelmer River, England.	12 32	10
Lyme Regis, England -	6 21	11½	8½	Malè, Maldives - -	12 30	3
Lymington England -	{ 10 25 12 15 }	{ 8	6	Malludu Bay, Borneo -	10 30	6-8
Lynn Deep, England -	6 0	23		Malo, St., France -	6 5	35
—— Harbour „ -		18		Malpelo Point, Peru -	4 0	10
—— Road „ -		20		Man-of-War Cay, Bahamas.	8 10	4
Mabou River, C. Breton Id.	9 0	4		Mana Island, New Zealand	7 0	8
Macahé, Brazil - -	2 30	9½		Manama, Persian Gulf -	5 20	7
Macao, China, E. Coast -	10 0	6½		Manawatu River, New Zealand.	10 0	8
Macassar, Celebes -	4 40	5½		Mancenilla Bay, St. Domingo.	7 0	4-5
McDougall Harb., Africa, S.W. Coast.	2 30	5½		Mandavee Roads, Hindoostan, W. Coast.	11 50	15
Maceio, Brazil - -	4 30	8½		Mangalaum Id., China Sea, E. Coast.	11 0	5
Machias, Seal Id., Bay of Fundy.	11 5	18	14¾	Manicouagon River, R. St. Lawrence.	2 15	12
Macowa, Red Sea -	0 30	2		Manila (Luzon Island), China Sea, E. Coast.	10 40	2½
Macquarie Harbour, Tasmania.	7 30	3		Manning River, Australia E. Coast.	10 0	
—— Port, Australia, E. Coast.	8 56	4-5		Manora P., Karachi, Hindoostan, W. Coast.	10 30	9½
Macquereau P., G. St. Lawrence.	2 0	5	3	Manorah R., Hindoostan, W. Coast.	1 30	16
Madame Id., Madagascar	4 0	5		Manta Port, Ecuador -	3 4	6
Madoc Port, Wales -	7 30	17		Manukau Har. (entrance), New Zealand.	9 30	13
Madras Road, Coromandel Coast.	7 34	3½		Manybranch Harb., Falkland Ids.	7 40	7½
Magadoxa, Africa, E. Cst.	4 30	8		Maplin Light (Thames), England.	12 5	14½
Magdalen Ids., G. St. Lawrence.	8 20	3	2	Maquereau Point, G. of St. Lawrence.	2 0	5
Magdalena Sta., Island, Magellan Strait.	12 0	10		Maranham, Brazil -	7 0	17½
Magdalene B., California	7 35	6½		Marblehead, United States	11 30	12
Mahato Id., Africa, E. C.	4 30	7		March Harb., Tierra del Fuego.	3 10	6
Mahneah R., Africa, W.C.	7 40	11		Marcouf, St., France -	9 55	20
Mahone Bay, Nova Scotia	8 0	7		Mare Harb., Falkland Ids.	6 0	6
Mahons R., United States	9 52	7	5¾	Margate, England -	11 40	15½
Maiden Rocks, Ireland, N.E. Coast.	10 43	6¾	6¼	Maria Sta., Id., Chile -	10 20	6
Majambo B., Madagascar	4 30	16		Maria Van Diemen Cape, New Zealand.	8 0	7
Makátein, Arabia, S.E. Coast.	9 0	6		Maristow, River Tavy, England.	5 47	8½
Makalleh, Arabia, S.E. Coast.	8 30	7		Marjoribanks Harbour, Korea, W. C.	3 30	29
Makumba R., Madagascar	4 45	17		Mark, St., Bay of, St. Domingo.	8 0?	1?
Makung Harb., Pescadores, China Sea.	10 30	9½	7	Marks, St., United States	1 14	3
Malabrigo Port, Peru -	5 0	2				
Malacca Strait (light vessel one fathom bank).	6 0	15	12			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	f.	ft.		h. m.	f.	f.
ver, Guayana	5 30	8	6	Mergui, Bay of Bengal, E. Coast.	10 30	11	
Bay of Bengal	2 20	21		Merigomish, Nova Scotia	10 6	5½	3½
Cove, Tierra	3 30			Merjee R., Hindoostan, W. Coast.	11 0	7	
o. — C. Horn	3 50	8		Merville, France	9 36	21	17½
rra del Fuego.	3 30	15		Metway Port, Nova Scotia	7 50	8	5
de la Arena,				Mevagizey, England	5 4	15½	11
. Coast.	3 45			Mexillones Port, Bolivia	10 32	3	
i Rocks, South				Mexen, White Sea	1 48	15-22	
pe St., New-	8 30	7	5	Miau-tan, (Depôt Bay), Yellow Sea.	10 35	6	
id.				Miaveness, Feroe Islands	3 12	6½	4½
Harb., Mada-	4 0	5		Michael, St., Azores	12 30	6	
E. Coast.				Michael Seymour Port, Gulf of Tartary.	5 30	3	
rfoundland -	7 40	7½	5	Middle Cove, Tierra del Fuego.	3 30		
St., I. of Man	11 10	20	11	Middle Island, Patagonia, W. Coast.	12 0		
Scilly Is. -	4 27	16	12	Middlesbrough, R. Tees, England.	3 55	13	
England -	11 3	18	13	Middleton R., Bight of Benin.	4 15	5	
rsian Gulf -	11 15	6		Milford Haven (St. Ann Lighthouse), Wales.	5 56	24	18
New Zealand -	11 10	8	6	Milford Sound, New Zealand, Mid. Island.	9 15	8	6
Bay (Tasman	8 45	13	9	Mullman Island, Palawan, W. Coast.	10 27	2½	
New Zealand.	9 50	14	11	Millport, Cumbræ Island, Scotland.	11 50	10	6
lay, Motu Pipi				Min R. (Temple Point), China, E. Coast.	10 45	11	14½
ew Zealand.				Min R. (Losing Island), China, E. Coast.	12 0		
Red Sea -	1 0	3		Mindanao, Filipinas	7 0	6	
ver, G. St.	2 15	11	7	Minehead, England	6 30	35	26½
e.				Mingan Harbour, Gulf St. Lawrence.	1 16	6	
er, Chile -	10 0			Mingauld, G. St. Lawrence	1 30	6	4
Bay of Bengal,	2 0	22	17	Minimegash, Prince Edward Island.	3 30	5	3
(Port Louis) -	12 30	3	2½	Minow Islands, Madagascar, W. Coast.	5 0	15	
Grand Port) -	1 0	1½		Minquiers Rocks, France	6 6	35	26
United States	8 19	6	5	Miramichi (Bar), Gulf St. Lawrence.	5 30		3
ay, Palawan -	9 55	3½		Mira-por-voa, Bahamas	9 30	3	2½
Indian Ocean	4 0	6½		Mirs Bay (Tide Cove), China, E. Coast.	10 0	6½	
Mozambique	4 10	11½		Miscou, G. of St. Lawrence.	2 30	5	3
Africa, S.W.C.		7		Mississippi, S.W. Pass, Gulf of Mexico.		1½	
Port, Mada-	4 30	15		Mistanoque, Labrador	10 30	6	3
				Mistley Quay, Stour R., England.	0 48	11½	
Mexico, W. Cst.	9 40	7		Mobile, Gulf of Mexico	irr.	1-2	
und, China, E.C.	12 30	17		Mocha Island, Chile	10 30		
Australia, S.C.	1 20	3					
, Africa, E. C.	4 15	11					
R., Africa,	7 40	11					
it.							
ef (Sand Cay),	7 55	5-6					
a, E. Coast.							
eland -	6 1	18½	13½				
Patagonia, E.C.	3 40	15					
Rock, Ba-	7 50	3					
Bay, C. Breton	8 15	5½					
er, (Paknam),	5 7	9½					
za, W. Coast.							
Bight, U.S. -	7 45	4	2½				
ld., S.E. end,	6 0						
rabia, S.E. Cst.	9 0	6½					
r, Banks Land		2					
lay, New Zea-	7 21	7					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	R
		Springs.	Ncaps.			
	h. m.	ft.	ft.		h. m.	ft.
Mocha Road, Red Sea, (E. Coast).	12 0	4½		Mutlah (Muda Kali), Bay of Bengal, West Coast.	11 45	15
Mogador, Africa, W. Cst.	1 18	10-12		Mutton Island, Ireland, W. Coast.	4 20	13½
Molyneux Bay, New Zea- land.	3 0	8	6	Myggenæs Fiord, Færoe Islands.	9 0	9½
Mombaza Port, Africa, E. Coast.	4 0	11		Naafe R., Bay of Bengal, E. Coast.	10 0	
Monach Ids., Scotland, W. Coast.	5 44	12½	8½	Naalsøe Fiord, Færoe Islands.	4 0	6½
Monckton (Railway), Bay of Fundy.	0 15	47	37½	Nafa-Kiang, Loo Choo Islands.	6 28	7
Mondego (Bar), Portugal	2 30	7		Nagasaki Bay, Japan Sea.	7 15	9
Monganui Harb., New Zealand.	8 15	9	7	Nagore, Bay of Bengal, W. Coast.	8 15	
Monomoy, United States	11 30	5½	4	Namki Ids., China, East Coast.	8 30	17
Monrovia, Africa, W. C.	6 0	6		Namoa Island (Clipper Road), China, E. Coast.	11 15	7
Montauk Pt., United States.	8 20	2½	2	Namquan Harb., China, E. Coast.	10 0	17
Monterey, California -	10 22	4½	3½	Nanaimo Harb., Gulf of Georgia, Vancouver Id.	5 0	14
Montrose, Scotland -	1 25	13	10	Nancowry Harb., Nicobar Islands.	9 15	8½
Monts, Point de, Gulf St. Lawrence.	12 0	12	6	Nangamessie Harbour, Sumba.	11 30	17
Moreno (Constitucion Road), Peru.	10 0	4		Nangka Id., Banka Strait		12
Moreton Bay, Australia, E. Coast.	9 30	3-7		Nanoose Harbour, Van- couver Id.	5 0	15
Morewellham, R. Tamar, England.	6 12	10½	6½	Nansaree River (Bar), Hindoostan, W. Coast.	3 0	18
Morjovets Id., White Sea	11 20	17		Nantucket, United States	12 24	3½
Morlaix Road, France -	4 53	24	18	Napoleon Road, Gulf of Tartary.	2 30	2½
Morro (Sandy Pt.), Ecuador.	5 0	11		Narrinda Bay, Mada- gascar, W. Coast.	4 30	15
Mossel B., Africa, S. Coast.	3 30	6		Narrows (First), Magellan Strait.	9 0	36-42
Moudinga Id., White Sea	5 50	3½		——— (Second), Ma- gellan Strait.	10 0	23
Mount Desert Island, United States.	11 10	13		Naruto (Fukura) Japan Sea.	6 17	7
Mourondava, Madagascar, W. Coast.	4 45	12		Nash Point, Bristol Channel.	6 25	33
Mouton Port, Nova Scotia	7 54	7½	5½	Nassau, New Providence, Bahamas.	7 30	4
Moville, Ireland -	7 6	7½	5½	Nassau Bay, Tierra del Fuego.	4 0	6
Mozambique Har., Africa, E. Coast.	4 15	12		Natal Port, Africa, S. C.	4 30	6
Mucaras Reef, Bahamas	7 40	3		Navallo Port, France -	3 42	13
Mugeres Harb. Bay of Honduras.	9 30	1½		Nazaire, St., France -	3 40	15½
Mullof Cantyre, Scotland	10 35	4		Naze, The, England -	12 6	12½
Mulroy Bay (Bar), Ireland	5 40	11½	8	Nee-ah Harbour, Oregon	12 33	7½
Mumbles Lt. House, Wales	6 1	27½	20½	Needles Point, England -	9 46	7½
Mungullo or Mongallo R., Africa, E. Coast.	4 45	12		Negapatam, B. of Bengal	5 0	3
Murdounah Id. (E. Cst.), Red Sea.	6 0	3		Negro Harbour, Nova Scotia.	8 12	7
Murray Islands, Torres Strait.	9 30	10				
Murray Pass, Bass Strait	11 10	8				
Musa Port, Babuyan Ids.		5				
Mutlah River, (entrance to Biddah River), Bay of Bengal, W. Coast.	10 0	14				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
er, Patagonia	11 0	14		Noamh Island, Scotland	5 2	11½	7
ew Zealand	9 50	14	10	Noel, Bay of Fundy	12 41	50½	43½
ort, Gulf St.	2 10	13	8	Noir Island, Tierra del Fuego.	2 30	5	
ce.				Noirmoutier, France	3 2	16	11½
—, River St.	8 30	14	9	Nolloth Port, Africa, S.W. Coast.	2 30	5½	
ce.				Norderney, Germany	10 30	II	
ord (entrance).	7 57	4½	4	Nore, England	12 30	15½	13
States.				Norfolk Island, S. Pacific	7 45	7	
e, United States	11 53	7	6½	North Cape, C. Breton Id.	8 0	4	
n, United States	11 16	6½	5½	— Edisto River,	7 10	7	5½
ndon, United	9 28	3	2½	United States			
				North Harbour, New-	8 0	7½	5
idence, S. W	7 30	4		foundland.			
hamas.				Sands, Malacca	5 30	15	12
helle, United	11 22	8½	7½	Strait.			
				Noss Island, Madagascar	5 0	15	
. Ireland	6 4	12½	10	Nova Zembla Harbour,	6 36	III	
Sound, Tierra	3 30			Lapland.			
so.				Nuevo Gulf, Patagonia,	7 0	10	
, United States	8 13	5½	4½	E. Coast.			
ort, United States	11 22	9	7½	Port, Central	3 10	12	
. Australia, E.	9 45	6-7		America.			
				Nukulan Port, Fiji Ids.	6 47	5½	
England	4 23	10½		Nunez River, Africa,	10 0	15	11½
Ireland	10 30	16	12	Nyminde Gab, Jutland	2 41	2	
, England	11 51	20	15	Nysna Harbour, Africa,	3 45	5	
United States	7 45	4½	4	S. Coast.			
Wales, (South	7 10	39	29	Oban, Scotland	5 22	12	9½
				Obb of Harris, Isle of	6 16	11½	8½
— (W. C.)	7 0	12	9	Harris, Scotland.			
, Wales	7 30	15		Observatory Id., China	11 0	5½	
Stewart, Scot-	12 0	12	6	Sea, E. Coast.			
. Coast.*				Ocracoke Inlet, United	7 4	2½	2
Bay, China,	8 30	5½		States.			
st.				Octavia Bay, New	3 30	13	
St., Harb., G.	1 55	12	7	Granada.			
rence.				Oclar Cape, Banka Strait	6 30	IV	
— Port, Peru	5 15	3		Oibo Harb., Africa, E.C.	4 15	6	
Port (Lambton	4 30	5	3	Olaveaga, Bilbao River,	3 15	12	
) New Zealand.				Spain.			
d. (Nancowry	9 15	8½		Old Pt., Comfort, United	8 17	3	2½
Indian Ocean.				States.			
t., Bay, Ma-	2 6			Old Providence, Bay of	irr.	1	
trait.				Honduras.			
alf (Port Her-	3 9	10		Olenji Islands, Lapland	7 30	12	
Cent. America.				Oleron, Ile d', France	3 50	IV	
Belgium	12 18	16	13	Omaider Island (Gulf of	6 0	4	
p, Netherlands	7 27	4	3½	Akabah), Red Sea.			
er (Nun en-	4 8	6		Omersary It., Hindoostan,	1 45	18	
Africa, W. Coast.				W. Coast.			
Chan., White	5 25	3		Omonville, France	7 29	15½	12½
				'Om-rasas-Masirah,	10 0	10	
fwr., White Sea	6 0	2		Arabia, S.E. Coast.			
ound, China,	10 30	20		One Fathom Bank Light,	6 0	15	12
				Malacca Strait.			
roup, China E.	10 0	5		Onega River, White Sea	9 17	6-7	
				Oolooogan Bay, China Sea,	9 30	5½	
. Yung River,	1 0	II		E. Coast.			
. Coast.							
America, N.W.	6 0	18	15				

* At Carty Quay.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Oonting Port, Ioo Choo Islands.	6 35	8		Pancol, China Sea, E.C.	9 40	6	
Oösima, Japan Sea -	6 50	5		Pausand Hole, England -	12 0	15½	
Oporto, Portugal -	2 30	10		Paposo, Chile -	9 40	5	
Orange B., T. del Fuego	3 30	5		Paquique Cape, Bolivia -	9 45		
—Cape, Magellan Str.	3 0			Para, Brazil, N. Coast -	12 0	11	
Orford Haven (Bar), Eng- land.	11 30	7½		Parahayba, Brazil -	5 0	9-12	
—Port, California -	11 26	6½	4½	Parenga renga Harbour, New Zealand.	7 54	7	
—Quay, England -	12 30	7½		Parida Id., New Granada	3 15	10½	
Orfordness, England -	11 15	8	6½	Pariboro, Bay of Fundy	12 17	43	3
Orinoco River (entr.) Guayana.	6 0	3		Pasado Cape, Ecuador -	3 30	10	
Orleans Id., R. St. Law- rence.	5 40	17	13	Passages Port, Spain -	3 0	12	
Ormond, Kenmare River, Ireland.	3 43	10	7½	Passage or Culebra P., Caribbean Sea.	9 0	1	
O-rsay, I. of Skye -	5 50	14½	10½	—Id., Banda Sea -	noon	6	
Orlov Letni C., White Sea.	5 18	4		Passandava Bay, Mada- gascar, W. Coast.	5 0	15	
Os Ilheos, Brazil -	4 30			Patapsco R. (Bodkin Pt.) United States.	5 42	1½	
Osaki, Japan Sea -	5 55	6½		Patersons Inlet, New Zealand.	1 10	8	
Oscuro Cove, Patagonia, W. Coast.	0 55	20		Patrick Port, Scotland -	11 10	15	1
Osprey Reef, Australia, E. Coast.	8 36	6		Patta B., Africa, E. Cst.	4 30	10	
Ostend, Belgium -	12 25	19	15	Paul de Loanda, San, Africa, S.W. Coast.	4 30	5	
Otago Har., New Zealand	2 50	7	5	Paul St. Id., Indian Ocean	11 0	3	
Otaheite, South Pacific -	noon	1½		—G. St. Lawrence	8 0	5	
Otterswick, Orkneys -	9 13	11	8	Paumben Pass, Bay of Bengal, W. Coast.	1 30	2	
Otway Port Patagonia, W. Coast.	11 37	6		Payta Port, Peru -	3 20	3	
Ounalashka Id., America, N.W. Coast.	7 30	7½		Peckett Har., Maglo. Str.	12 0	6	
Ouro R., Africa, W. Cst.	12 0	8-9		Pedro Gonzalez, New Granada, (Trapichi Island).	3 50	16	
Ouse, R (Goole), England	7 44	14		Pedro San., Pass, Patagonia, W. Coast.	0 30	9	
Ower Shoal, England, E. Coast.	6 30			—San Bay, California	9 39	4½	
Oxboasheia, Norway -	12 0	8		Peel, Isle of Man -	11 8	16½	1
Oyster Bay, United States	11 7	9½	8	Pegasus Port, New Zealand	11 50	8	1
Oystreham, France -	9 38	21	16	Pei-ho or Peking River, (entrance), Yellow Sea.*	3 10	10	8-
Packsaddle Bay, Tierra del Fuego.	3 30	6		—(Tien-tsin)		4½	
Padstow, England -	5 13	20½	16½	Pelew Islands, N. Pacific		6	
Pagham (entrance), England.	11 30	16½	12½	Pelican Lagoon, Kangaroo Id., Australia.	5 0	6	
Paimpol, France -	6 0	31	23½	Pelorus Sound, New Zealand.	9 35	11	7
Palais, Port le, Belle Ile, France.	3 18	14½	10½	Pemba Channel, Mozam- bique.	4 0	11	
Palliser Cape, New Zealand	6 0	6		—Id., Mozambique	4 15	12	
Palma, Canary Ids. -	12 30?	9?		Pembroke Dockyard, Wales.	6 12	21	15½
Palmas Cape, Africa, W. Coast.	4 30	4		Penang, Malacca Strait -	12 0	9	7½
Palmedo Road, Sumba Id.		15		Peñas Cape, Tierra del Fuego.	6 2	12	
Palmeira Point, Ceylon -	9 30	7-11		Pender Harb., Strait of Georgia, America, N.W. Coast.†	6 0	12	14
Palaoan Bay, Mindoro -		5		Peniche, Portugal -	1 54		
Pamarung Ids., Borneo, E. Coast.		8-10		Peomark Rocks, France	3 15		
Pampang Bay, Java -		7-8					
Panama Road, Central America.	3 23	15-22	10-16				

* Time and rise much affected by winds.

† From observations made in the month of October.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
R., Bight of	4 15	5		Pillar C., Magellan Strt.	1 0		
G. of Mexico		1½		—— Cape, Tasmania -	1 0	6	
R. Tamar,	5 55	13½	9½	Pillars, R. St. Lawrence	5 0	17	10
irth, Stroma,	9 47	9	6½	Pinas Bay, New Granada	3 15	14	
S. Side.				Pinmill, Orwell River,	12 20	12	
wona, E. Side	10 24			England.			
—— W. Side	9 35			Pio Quinto Port, Babu-	6 0	6	
reat Skerry,	11 4	9½	6	yan Islands.			
E. Side.				Pisco Bay, Peru -	4 50	4	
—— W. Side	10 53			Piti Palena, Patagonia,	12 23	10	
England -	4 30	16½	12½	W. Coast.			
, Middle or	10 30	16	13	Pitty, Hindoostan, W. C.	10 5	9	
South or	10 30	14		Placentia, Newfoundland	9 15	8	
et, Australia,				Playa Marie Bay, Cali-	9 20?	7-9?	
G. of Aden -	12 0	7		fornia.	1 8		
, Brazil -	4 45	8-6		Playa Parda Cove, Ma-			
hos, Indian	1 30	5		gellan Strait.			
, Strait, Japan	10 30	6		Pleasant Port, Falkland	5 0	6½	
land -	3 35			Islands.			
lds. (Makung	10 30	9½	7	Plettenberg Bay, Africa,	3 10	6	
hina Sea.				S. Coast.			
ay, C. Breton	7 30	6	4	Ploughrescan, France -	5 17	25½	18½
Harb., Prince	8 30	4	2½	Ploumanach, France -	5 15	24½	18½
Island.				Plumper Cove, Howe	noon.	12	
Scotland -	0 34	10½	8½	Sound, G. of Georgia,			
ge, B. of Fundy	10 41	22	18	America N. W. Coast.*			
B. of Islands,	10 42	5½		Plymouth Breakwater,	5 37	15½	11½
Island.				England.			
, St. Francis	12 0	6		—— (Sutton Pool)	5 32	15½	11½
ralia, S. Coast.				—— United States	11 19	11½	10½
ck, Patagonia,	0 50	16		—— New, New	9 30	12	9
oint, Wusung	0 35	13	8	Zealand.			
ina, E. C.				Pomba B. Africa, E. Cst.	4 0	15	11
a, U. States -	1 18	6½	5½	Pomquet, Nova Scotia -	9 15	4	2½
E. side, Ma-	9 30	24		Ponga River, Africa, W.	7 30	12	9½
rait.				Coast.			
, Capel Bay,	2 30	3-4		Poolbeg Lt. Hse., Ireland	11 12	12-14	9-11
, S. Coast.				Poole, England -	{ 9 10	{ 6½	4½
entrance,	1 30	3-4		{ 12 45	{ 14½	10½	
, S. Coast.				Poolewe, Loch Ewe,	6 39		
Queenscliff	1 30	3		Scotland.			
Hobson Bay,	3 0	3-4		Pootoo Island, China, E.	8 15	12	
, S. Coast.				Coast.			
R. (Cherry	10 5	2	¾	Poqueldon Harb., Pata-	0 54	18	
United States.				gonia, W. Coast.			
e Bay, Chile -	9 20	5		Portaferry, Ireland -	12 0	18-21	12-16
, Nova Scotia	10 0	6	4	Port-au-Choix, Newfound-	10 47	5	
Lombok -		10-12		land.			
ur, England -	11 5	28	21	Port au Prince, Saint	8 0?	1?	
Newfoundland	8 33	6½	4½	Domingo.			
, Yellow Sea	11 45	8		Port-en-Bessin, France -	8 57	20	15½
ds., China, E.C.	8 30	17		Portchester, England -	11 46	13½	10½
				Portendik, Africa, W. C.	10 0	6	
				Porth Cawl, Wales -	6 8	28½	21½
				Porth-dyn-lleyn, Wales	8 30	16	
				Portishead, England -	7 16	41½	31
				Portland Inlet (Salmon	1 8	16	
				Cove) America, N.W.			
				Coast.			
				—— United States	11 25	10	8½

* From observations made in the month of October.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Portland Bay, Australia, S. Coast.	Midnight.	4		Pulo Mendanao, Gaspar Strait.	2 30	4	
Breakwater, England.	7 1	6½	4½	Pulo Panjang, G. of Siam	7 0	2	
Porto Frio, Brazil -	2 40	4½		Pulo Timoan (W. side), China Sea, W. Coast.	6 0	7½	
Porto Praya, C. Verde Ids.	6 0?	5		Puluqui Id., Patagonia, W. Coast.	1 5		
Portree, Isle of Skye -	6 32	15	10¾	Puna Island, Ecuador -	6 0	11	
Portrieux, France -	6 0	31	23½	Pwlheli, Wales -	7 46	13½	
Portsbridge (Portsmouth) England.	11 48	6½*	4	Quaco, Bay of Fundy -	11 35	30	2
Portsmouth Dockyard, England.	11 41	12½	10	Quebec, R. St. Lawrence	6 38	18	1
Portsmouth, United States Possession Bay, Magellan Strait.	11 23	10	8½	Queda, Malacca Strait -	12 0	5½	
Cape, Torres Strait.	9 0	36-42		Queen Charlotte Sd. (entrance), New Zealand.	8 50	8	
Id., Torres St.	1 0	6		Queensferry, Firth of Forth, Scotland.	2 37	18	1
Post Office Island (Charles Island), Galapagos.	2 10	9½		Queenstown, Ireland -	5 1	11½	
Id., Torres Str.	1 0	6		Quelan Cove, Patagonia, W. Coast.	0 28		
Pouinipet Island, Caroline Islands, N. Pacific.	6 0	9½		Quentin, Port San, California.	9 5	9	
Poulamente B., Madame Id., C. Breton Id. -	7 50	4½		Quicavi Bluff, Patagonia, W. Coast.	0 57	20	
Poulton-le-Sands, England	11 26	6	4	Quicks Hole (S. side), U.S. (N. side) -	7 36	3¾	
Poverty Bay, New Zealand	6 5	27½	21½	Quilca River, Peru -	7 31	4¼	
Pratas Shoal, China Sea	4 0	6		Quilimane R. (entrance), Africa, E. Coast.	8 0	6	
Preservation Inlet, New Zealand.	11 20	5		Quillebœuf, France -	4 15	16	
Preston, England -	11 49	8	6	Quillebœuf, France -	10 6	9½	
Prince Frederick Harb., Australia, N.W. Cst.	12 0	10	4½	Quiloa, Africa, E. Coast	4 45	12	
Prince of Wales Strait, Banks Land.		28		Quoile Quay, Strangford, Ireland.	12 45	11	
Princes Id., Bight of Biafra	3 45	3		Rabat, Africa, W. Coast	1 46	9-12	
Princess Royal Harbour, Australia, S. Coast	11 56	4½		Rachada Cape, Malacca St.	5 30	13	
Prony Bay, New Caledonia.		1-4		Radama Port, Madagascar, W. Coast.	4 40	13	
Provincetown, U. S. -	11 22			Ragged Id., Sumbawa, Java Sea.	8 10	3	
Pubnico (Beach Point), Bay of Fundy.	9 25			Point, Borneo, E. Coast.		7	
Puerto Bueno, Patagonia, W. Coast.	1 40	10¾	9½	Raine Id., Torres Strait	8 10	10	
Puerto de la Luz, Gran Canaria, Africa, W. Cst.	12 52	12	10	Rajahpoor Harb., Hindoostan, W. Coast.	11 0	12	
Puerto de la Plata, St. Domingo -	7 30	10		Rajang River, Borneo -	4 45	13	
Puget Sound (Nisqually), America N.W. Coast.	6 0	3?		Ramos R., Bight of Benin	4 20	5	
Pugwash Har., Nova Scotia	10 30	18	15	Ramree Road, Bay of Bengal, E. Coast.	10 0	12	
Pulaski Fort, United States	7 20			Ramsay Sound, Wales -	6 0	17	
Pulicat Shoals, Coromandel Coast.	9 25	7	4	Ramsey, Isle of Man -	11 12	19½	1
Pulo Aor, Sumatra, N.E. Coast.		8	7	Ramsgate, England -	11 44	15	1
Pulo Condore, China Sea, West Coast.†	2 30	2½		Ramso Fiord, Norway -	10 45	7	
Pulo Leat, Gaspar Strait	2 30	5		Rangoon, Bay of Bengal, E. Coast.	5 30	21	14
				R. (entrance) B. of Bengal, E. Coast.	3 15	21	14
				Raoul or Sunday Island, S. Pacific.	6 0	5	
				Rappahannock (Saunders Wharf), United States.	3 2	2½	2
				Rás Haffún, Africa, E. C.	6 15	4	

* Above the bed of the lake.

† From a French survey, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
ommed (Gulf of Aden), Red Sea.	6 0	5		Ristegouche R., Campbelltown, G. St. Lawrence.	4 0	10	7
armah, Arabia, east.	9 0	8		Rivadeo, Spain, N. Coast.	3 0	15	
hemeh, Persian Gulf.	11 45	7		Rivoli B., Australia, S.C.	10 0	4	
sidah } Arabia {	8 30	5½		Rocas, As, Atlantic	5 15	10	
ali } S. E. {	10 0	10		Roche Cape, R. St. Lawrence	9 30	6	4
ed } Coast {	9 30	9		Rochefort, France	4 6	17	13
an, Ireland	5 42	12½	9	Rochelle, France	3 31	17	13
(G. of Cambay),	2 15	18	13	Rockport, United States	10 57	10½	8
istan, W. Coast.				Rockall, N. Atlantic	3 30	12	
Cent. America	3 6	11		Rocky Id., G. of Siam	4 0	4	
i Inlet, Patagonia, W. Coast.	0 44	14		Rodrigue Id., Ind. Ocean	1 45	6	
, Ceylon, South	2 20	2½		Romania Point (Malay Penin.), China Sea, W. Coast.	10 30		
-(Pier), Ireland	10 31	4	4	Rondals Ids., Norway	10 45	6	
Labrador	7 45	3½	1½	Rona (South) Light, Scotland.	6 20	14½	10½
Darian Strait	5 0	10½		Roodewall Bay, Africa, S.W. Coast.	2 30	6½	
ge, England	{ 10 42	{ 8½	6	Roque, Cape St., Brazil		10	8
love, Bass Strait	{ 12 57	{ 12½	26	Roscoff, France	4 46	23	17½
le, France	6 20	33	13½	Rosel, Jersey, English Channel.	6 15	11	21½
k, Iceland	5 0	17½		Rosnoff Cape, America, N.W. Coast.	7 30	15	
ous Id., Borneo, Coast.		8		Rota, Spain	1 24	12½	8
rg, Denmark	7 42	4		Rotterdam, Netherlands	3 45	7	
, R. Clyde, Scot-	1 15	9		Rouen, France	2 28		
				Rouge Harbour, Newfoundland.	7 0?	2-4?	
m B., Marquesas	2 30	4		Roundstone, Ireland	4 28	13½	10½
Port, Tanna Id.	5 35	3		Rovama River, Africa, E. Coast.	4 0	16	11½
Id., (St. Pierre)	noon.	3½		Royal Harbour, Rumania, Bay of Honduras.	7 45	3½	
O. (St. Denis)	0 22	2½		Royal Island, Bahamas	7 45	3½	
Id., (St. Gilles)	1 0	2½		Royal Port, Jamaica	11 0	1	
O. (St. Paul)	1 7	4		Royalist Port, Palawan, E. C.	11 0?	6½?	
ad, Fiji Islands.				Royan, France	3 38	13½	10
ukulau Port.				Ruapuke Id. (Foveaux St.) New Zealand.	1 0	■	6
io Strait	10 0	7	5	Rugged Id., Bahamas	8 0	3	
ighthouse, Eng-	10 51	24	17	— Nova Scotia	7 59	7½	6
				Ruggles B., Falkland Ids.	7 30	5	
to R., Gulf St. George.	3 30	4	2½	Rush Port, Ireland	6 8	5½	3½
d, United States	4 28	3½	2½	Rutland Id., Ireland, W. Coast.	5 22	11	8
Harb., Prince of Wales Island.	6 0	3	2	Ryde, England	11 20	13½	
., Australia, E.C.	9 20			Rye Bay, England	11 20	22	17½
la Plata, Cape Horn.*	8 30	2		Sabine Pass, G. of Mexico		1½	
— — — Buenos	12 0	3-5		Sable Cape (Clam Point), B. of Fundy.	8 27	8½	6½
— — — Barragan	7 0	5-9		— (Clarks Harb.), B. of Fundy.	8 58	11	9
l. America, E. C.				Sable Island, N. side, Nova Scotia.	7 30	4	
ande do Sul,		14-2		Sable Island, S. side, Nova Scotia.	6 30	4	
iro, Brazil	3 0	4	3				
gro, Patagonia,	11 0	14					
st.							
ss, Africa, West	10 0	15	11½				

* Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Ri
		Springs.	Neaps.			
	h. m.	ft.	ft.		h. m.	ft.
Sables d'Olonne, Les, France.	3 26	14	10	Sandy Hook, United States	7 29	3½
Saboga, New Granada -	1 9	14		— Id., Madagascar, W.C.	5 0	15
Sabon Id., Darian Strt. -		10		Sanguanga (entrance)	4 10	9
Sacred Bay, Newfoundland	7 23	2½		Ecuador -		6
Sacrificios Pnt., Mexico, W. Coast.	3 15	6		Sanguir Island, Moluccas		4
Saddle Id., East, China, E. Coast.	11 0	14		Sangwin R., Africa, W. Cst.	5 15	15
Sado (Yebisu), Japan Sea	5 0	2		Sanmoon Bay (St. George Island), China, E. Coast.	10 20	5-6
Saguenay, Chicoutimi, G. St. Lawrence.	4 11	12	8	San-shui, Si Kiang, China, E. Coast.		5?
Saguenay, Tadousac, G. St. Lawrence.	2 45	17	10	Santa Catalina Id., Cali- fornia -	9 35?	40
Saigon (C. St. James) -	11 0	8		Santa Cruz R., Patagonia, E. Coast.	9 30	9
— (Saigon City),	5 30	9½		Santa Cruz or Agadir, Africa.	12 45	5?
Cochin China.				Santa Island, California	9 35?	8
Saintes, Caribbean Sea -	6 45			— Tenerife, Canary Is.	1 30	6
Sal, C. Verde Ids., Africa, W. Coast.	7 45	5		Santa Maria Island, Chile	10 20	15
Salango Id., Ecuador -	12 41	12		Santander, Spain -	3 30	12½
Salcombe, England -	5 41	15	11½	Santona, Spain -	3 30	6
Saldanha B., Africa, W.C.	2 0	6		Saparoua Id., Moluccas -	1 0	9
Sale Macowa, Red Sea -	0 30	2		Sapie Bay, Sumbawa -	4 0	10
Salem, United States -	11 13	10½	8	Sarawak R. (Moratabas entr.)	4 0	10
Salm R., Africa, W. Cst.	8 10	6		— Santubong (entr.)	5 0	15-18
Salmedina Rocks, Spain	1 27	12½	8	— Sarawak Junction	5 20	15-18
Saltash, R. Tamar, Eng- land.	5 45	15	11	— City -		
Salt Cay Anchorage, Bahamas.	8 15	4	3	Borneo, W.C.		
Saltees, St. George's Channel.	5 40			Sarn Badrig or the Causeway, Wales.	7 30	13
Salvador, San, Port, Falk- land Islands.	8 10	8		Saro-y-bwch Reef, Wales	7 40	12
Samanco B., Peru -	6 30	2		Saugor Id., B. of Bengal	8 0	6
Sambilangs, Malacca St.		12	10½	Saunarez Reef, Australia, E. Coast.		7½
San Francisco (North Beach), California.	12 6	4½	3½	Savannah (city), U. S. -	8 13	7 20
San Bartholomew Port, California.	9 10?	7-9?		— (entrance,) U.S.	7 20	12 0
San Blas, Mexico, W. C.	9 41	6½		Scales Point, Blackwater River, England.	12 0	9 30
San Juan (anchorage), California.	9 40?	5		Scalloway, Shetland -	4 11	15½
— del Sur, Cen- tral America.	3 8?	10?		Scarborough, England -	7 10	5 31
— River, New Granada -	6 0	12		Scarcies Rivers, Africa, W.C.		4 30
San Lucar, Spain -	1 53	12½	8	Scarnish, Tiree Id., Scotland.	4 27	12 45
San Miguel, California -	9 25	5		Scilly (St. Agnes Id.) -		6 16
San Rosa Id., California	9 30?	5?	4?	— (St. Mary Id.), England.	12 45	6 16
Sand Cay, United States	8 40	2	1	Sea Bear Bay, Patagonia, E. Coast.		3 24
Sandalwood Bay, Fiji Ids.	6 0	6?		Seaforth Loch, Athline, Scotland.	10 54	9 49
Sand Point, G. of Liau- tung, Yellow Sea.	4 50	7	5½	Seaham, England -		6 44
Sands Pnt., United States	11 13	9	7½	Seal Cove, Grand Manan, B. of Fundy.		2 0
Sandy Cape, Australia, E.C.	7 50	6-8	17½	Seal Id., C. Sable, Bay of Fundy.		7 0
— Cove, E., B. of Fundy	10 33	21½	19	Seamount Bay, Mulroy B., Ireland.		
Sandy Cove, W., Bay of Fundy.	10 47	23		Sebastian, San, Brazil -		
				— Tierra del Fuego		

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neap.			Spring.	Neap.
	h. m.	ft.	ft.		h. m.	ft.	ft.
, Spain, N. Coast	3 0	12	9	Shucartie Bay, Vancouver Id.		12	
ur Bay,* Hin-				Si Kiang or West River, China, E. Coast:			
n, W. Coast.				" (San-shui) -			5-6
, China Sea, W.C.	9 44	7		" (Shuo-king) -			3
e de, France -	3 21	17½	12	" (Wuchan) -			1-1½
Bay, Lapland -	7 9	9		Siak River, Malacca Str.	9 0	12	
hill, England -	11 45	16½	12½	" off the town -		11	
noo Bay, Gulf of	2 0	12		Sidmouth Cape, Australia, E. Coast.	9 15	10	
ria, America,				Sierra Leone, Africa, W.C.	7 55	■	
Coast.				Sillebar R. (Bar), Sumatra	6 0	4½	
Africa, W. Coast	10 30			Simidsu, Japan Sea -	7 30	7	
Bk. Mosquito Cst.	irr.	2		Simoda Port, Japan Sea	5 0	3-5	
la Bank, Mosquito		2		Simonoseki, Japan Sea -	8 30	8	6
				Simons Bay, Africa -	2 44	5½	3½
Islands, Hang-chu	11 45	14		Simons St., Island, U.S.	7 43	8½	6½
China, E. Coast.				Singapore, New Harbour,	9 45	10	7½
Portugal -	2 30	8		Malacca Strait.			
River, (entrance,)	3 31	15	11½	Sinou, Africa, W. Coast -	5 0	4	
be.				Sir C. Hardy Id., Torres	9 15	10	
le Archip. (Mayhé	4 0	6½		Strait, E. Coast.			
idian Ocean).				Sir E. Pellew Islands,	7 30	4-7	
Id., Ladrone Ids.	6 45	2½		Australia, N. Coast.			
lands, Lapland -	8 20	12		Sisal, Gulf of Mexico -		2	
Bay, Gulf	1 40	9	5	Sitka, America, N.W.C.†	0 34	5-7	
awrence.				Skaapen Fiord, Færø			
Kadún, Arabia,	9 20	10		Islands:			
Coast.				Between Stormoe and	5 0	9½	7½
-saifeh, Arabia,	9 45	10		Sandoc.			
Coast.				Between Hestoe and	5 30	9½	7½
Harb., Falkland	9 30	6		Sandoc.			
				Skagen or the Skaw,	5 56	1	
ni, Yang-tse-Kiang,	0 40	10	7	Jutland.			
1, E. Coast.				Skerry, Great, E. side,	11 4	9½	6
ng, Si Kiang,		3		Pentland Firth.			
2, E. Coast.				Skerry, Great, W. side,	10 53		
Persian Gulf -	1 0	6		Pentland Firth.			
B., Australia, E.C.	12 0	2-5		Skerries, Ireland, N. Cst.	6 15	5	3
Harbour, New	1 0	4	2	" E. Coast. -	11 0	13	10
swick.	8 0			Skip Ness, Scotland -	11 50	9	
aven, Ireland -	5 32	11½	8½	Skull, Ireland -	4 2	9½	7½
sa, England -	0 37	16	13½	Slaughden, Orford, Eng-	1 0	7½	
Harb., Nova Scotia	8 8	6½	4½	land.			
Island, Africa, S.C.	4 40	12		Slievebane Bay Ireland,	5 49	10½	7½
d Island, U. States	10 58	8½	7½	W. Coast.			
ne, Nova Scotia -	8 4	7	5½	Sligo (Bay), Ireland -	5 18	11½	
ke Island, Gulf	6 0	5	3	" Harbour, Ireland	5 23	11½	8½
awrence.				Slyne Hd., Ireland, W.C.	4 30	13½	10
R., Africa, W.Cst.	6 0	11		Smalls Lighthouse, St.	6 0	21	
, North, England	3 23	13½	10	Georges Channel.			
Bay, Yellow Sea	1 30			Smerwick, Ireland -	3 50	11½	8
arb., Nova Scotia	7 54	6½	4½	Smithville, United States	7 19	5½	4½
(New Id.),	10 30			Smoky Bay, Australia,	12 15	6	
land Islands.				S. Coast.			
an, Gulf St.	3 42	5½	3	Smyth Harbour, Tierra	12 0	6½	
ence.				del Fuego.			
lay, Australia, N.C.	6 0	18-25	14-20	Snape Bridge, Orford,	3 0	6	
E. Coast -	8 30			England.			
Vater B., Australia,	10 30	12-18					
rest.							
am, England -	11 34	18	13½				

g tides rise a.m. 6 feet, p.m. 7½ feet from October to March; and the contrary during the rest of

ise at Sitka as given by Commander Pearce, H.M.S. Alert, in his remarks in 1860, does not
 feet, but on the authority of Commander Pike, H.M.S. Devastation, (1862,) the local pilots say
 rise sometimes is as much as 16 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	R
		Springs.	Neaps.			Springs.
	h. m.	ft.	ft.		h. m.	ft.
Socoa, France - -	3 19	12½	8¾	Streaky Bay (Blancheport), Australia S. C.	1 0	5
Socotra Id., Indian Ocean	7 20	8		Stroma, S. side, Pentland Firth.	9 47	9
Sofala R., Africa, E. Coast	4 0	19		Stromness, Orkneys -	9 0	10
Solovet Road, White Sea	5 0	4		Suadiva Atoll, Maldives	1 0	4
Solway (Tarn Point), Scotland.	11 22	23	18	Sual Port, Luzon - -		6
Sosnovaia Bay, White Sea	2 40	6		Suderoe Fiord, Færoe Ids.	6 0	9½
Sosnovets, White Sea -	11 44	18		Suez Bay (head of Gulf), Red Sea.	2 0	6
Souma, White Sea -	6 30	5½		Sughrá, Arabia, S.E. Cst.	8 0	6
South Farallon, California	10 37	4½	3½	Sumburgh Head, Shetland	9 45	
South Rock, Ireland ,	10 58	13	10½	Sunday or Raoul Island, S. Pacific.	6 0	5
Southampton, England -	{ 10 30	} 13	9½	Sunderland, England -	3 22	14½
South West Bay, New Providence.	{ 12 45			— N., England -	2 30	15
— Cape, N. Zealand	7 30	4		Supé Bay, Peru - -	4 50	3
Southernness, England -	12 0	7	5	Surat, Hindoostan, W. C.	4 0	19
Southwold, England -	11 20	28		Surin, St., France - -	4 11	14½
Spain, Port, Trinidad -	10 20	6½	4½	Surinam, Guayana -	6 0	5½
Spensers Anchorage, Bay of Fundy.	4 30	4	3	Sussex Port, Falkland Ids.	8 15	6
— Bay, Africa, S.W. Coast.	11 42	39	33	Sutton Pool, England -	5 32	15½
Spenser Gulf, (Thorny Passage,) Australia, S. Coast.	10 50	5-6		Sviatoi Nos, Lapland -	9 15	14
— Point Lowly -	12 0	6-8		Svineoe Fiord, Færoe Ids.	12 0	6½
— Port Augusta* -	7 0	6-8		Swain Reefs, Australia E. Coast.	10 25	10
— Point Riley -	8 30	9-12		Swan Id., Bass Strait -	9 35	6
— Wallaroo -	5 45	4½		— River, Port Grey, Australia, W. Coast.	9 0	1-1½
Spicers Cove, B. of Fundy	irr.	4-5		Swansea, (Mumbles Lighthouse), Wales.	6 1	27½
Spider Id., China, E. C. -	11 35	37	30½	Swift Bay, Australia, N. Coast.	12 0	21
Spitzbergen (Bell Sound)	10 0	17		Swona, E. side, Pentland Firth.	10 24	10
Spurn Pt. (Humber R.), England.	8 56	3¼	15	— W. side, Pentland Firth.	9 35	10
Staten Island, Tierra del Fuego.	5 26	18¾		Sydney, Australia, E. Cst.	8 38	4½
Staunton Id., Yellow Sea	4 30	8		— Harb., Cape Breton	9 0	5
Steilacoom Fort, Oregon	1 30		9½	Table Bay, Africa, W. Cst.	2 40	5
Stephen Port, Australia, E. Coast.	4 46	11		Tabou R., Africa, W. Cst.	4 45	3-4
— Falkland Islands.	9 0	6		Tabuai Island, S. Pacific		3
Stewart Harbour, Tierra del Fuego.	7 45	7½		Tadeo, San, River, Patagonia, W. Coast.	11 45	6
Stirling, Firth of Forth, Scotland.	2 50	4		Tahiti, S. Pacific -	noon.	1½
Stirrup Cays, Bahamas -	3 52	7½	4½	Tahrí, Persian Gulf -	5 0?	
Stockton (Tees), England	7 0	4		Taichow Ids., China, E. C.	9 0	14
Stonefield (Loch Etive), Scotland.	4 40	11		Tai-Tai Bay, China Sea, E. Coast.	9 30	5½
Stonehaven, Scotland -	7 3			Talcahuano, Chile -	10 14	5
Stonington, United States	1 10	14	11	Talcan Island, Patagonia, W. Coast.	1 3	15½
Stornoway, Lewis Island, Scotland.	9 7	3¼	3	Tailung Channel, Canton River, China.	1 30	6½
Strangford (Killard Point), Ireland.	6 46	13	9½	Ta-lien-whan Bay, Yellow Sea.	10 10	12
— Quay - -	10 53	14	11½	Tam-Sui Harbour, China Sea, E. Coast.	11 45	7-12
— Head of Lough (Turley Rocks).	12 31	10½	8¾	Tamar R., George Town, Tasmania.	11 15	12½
	12 44	11½	9½			

* At Port Augusta, when the winds veers round to West and South, and blows strong, the rise has been as much as 16 feet. Commander John Hutchison, R.N., Admiralty Survey, South Australia, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neap.			Spring.	Neap.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Launceston,	1 0	12½		Thompson Id., New Zealand.	11 30	8	6
Port, Magellan	3 5	5		Thorny Passage, Spencer Gulf, Australia, S. C.	12 0	6-8	
Madagascar,	4 18	8		Thorsminde, Jutland -	3 34	2	
United States	11 21	1½	1½	Three Hummock Island	10 30	10	
Channel,	6 0	6	5½	(E. side), Bass Strait.			
Farmer Islands,	6 37	14	10½	Three Kings Islands, New Zealand.	8 0	7	
Peru, N. Coast	1 42	8		Three Points Cape, Africa, W. Coast.	4 0	4	
Port, Mada-	4 30	6		Three Rivers, River St. Lawrence.	11 30	1	
Coast.				Throgs Point, U. S. -	11 20	9½	7½
China Sea		7		Thurso, Scotland -	8 28	14½	11
Malacca	9 30	10½	8½	Ticao Island, (Port San Jacinto) Filipinas.	6 30	6	
Hebrides -	5 35	3		Tictoc Bay, Patagonia -	1 45	11	
U. States	0 42	2	1½	Tien-pak Harb., China, East Coast.	12 0	8½	
Harbour, Su-	6 10	6		Timballier Bay, G. of Mexico.	irr.	2	
er New Ply-	9 30	12	9	Tinghae, Chusan, China, E. Coast.	11 0	12	9
land -	4 57	14½	10½	Tobago, Caribbean Sea -	irr.	3½	
o -	1 46	6	3½	Tobermory, Isle of Mull	5 36	13	9½
olway, Scot-	11 23	23	18	Toboe Ali Point, Banks Strait.	8 30PM* } 10 0AM† }	12	
Love, United	8 4	2½	2½	Tomo (Seto-uchi), Japan Sea.	11 0?		5
United States	9 57		3½	Tongatabu, S. Pacific -	6 50		
he, Nova	10 0	8	5	Tongsang Harb., China, E. Coast.	11 30	12	
ay, Japan Sea	5 50	5		Tonning, Germany -	2 1	9	
harbour, New	7 10	6	4½	Tooniang Id., Rias Bay, China, E. Coast.	8 0		
Entrance) Bay	10 30	20		Torbay, England -	6 0	13½	10
, E. Coast.				Toro Point, Chile -	9 45		
(Bar), Scot-	2 6	16	14	Tortola, Virgin Islands -	8 30	1½	
bay, China	10 15	6		Tortugas, Florida, U. S.	9 56	1½	1
Coast.				Towan Id., China, E. C.	9 20	13	
oad, Baly. (N.	5 0	6½		Tower Id., Galapagos -	?	?	
., Ireland -	5 16	11½	8½	Townshend Harb., Tierra del Fuego.	2 30	5	
er), England	3 45	15		Townshend Port, Oregon	3 49	5½	
, England -	6 0	18	9½	Tracadie, Prince Edward Island.	7 0	3½	2
es -	6 0	27	20	Tras Islands, Norway -	11 45		
pe Verd Ids.,			6	Trawbreaga Lough, Ireland.	6 10	11½	8½
uz).				Tréguier, France -	5 32	25	18½
tores -	12 32	4½		Trek Island, White Sea -	10 48	20	
., Lapland -	7 20	17		Trepassey, Newfoundland	7 0	6½	5
(West),	8 40	6	5	Tréport, France -	11 9	27	21
ds.				Tres Cruces Point, Patagonia, W. Coast.	1 15	16	
ite Sea -	3 17	7	1½	Triangles, Gulf of Mexico		1½	
ica, N. Coast	2 23	2½	3½	Trincomalie Har., Ceylon, S. Coast.	8 18	2	1½
ide Shoals),	6 30	4		Tringano R., G. of Siam, China Sea, W. Coast.	6 0	7	
da.							
nd, Australia,	10 45	12-18					
Id., Africa -	3 25	4½					

* In S.E. monsoon.

† In N.W. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Noaps.			Springs.	No.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Trinidad (Port Spain), Caribbee Islands.	4 30	4	3	Urakami, Japan Sea -	7 30	6	1
Trinity Bay (Bull Id.) Newfoundland.	7 22	3½	2	Uranouchi, Japan Sea -			
Opening, Great Barrier Reefs.	9 15	7-12		Urie Firth, Shetlands -	9 45	6½	1
Tristan d'Acunha, South Atlantic.		8		Ursula Id., Palawan, China Sea, E. Coast.	11 0	7½	
Triton Harb., New- foundland.	7 0?	2-4?		Ushant, France - -	3 32	19½	15
Tromsø, Norway - -	1 45	8		Ushruffi Islands, Red Sea	6 14	2	
Troon, Scotland -	11 50	10	7½	Utria, New Granada -	4 0	12	
Tronbridge Sheals, Aus- tralia S. Coast.	3 30	6		Værø, Norway - -	12 0	9	7
Truro, England (Town Quay).	5 5	10	6	Valdivia Port, Chile -	10 35	5	
Tsang chow Id., Bias Bay, China, E. Coast.	8 30			Valentia Harb., Ireland -	3 42	11	6
Tsau-liang-hai or Chosan Harb., Japan Sea.	7 45	7	5	Valentine Harb., Magellan Strait.	2 0		
Tsu-sima Sound, Japan Sea.	8 30	8		Valery St. en-Caux, France	10 46	27	21
Tsugar Strait, Japan Sea	5 0	5		sur-Somme,	11 46	27	21
Tudwall, St. Road, Wales	7 45	14		France.			
Tumaco Road, Ecuador -	2 33	12		Vallay, North Uist, Scot- land, W. Coast.	6 10	11½	6
Tunis, Mediterranean -		3		Vallenar R., Patagonia, W. Coast.	0 18	5	
Turna Bay, White Sea -	9 54	11		Valparaiso, Chile -	9 32	5	
Turner C., Prince Edwd. Island.	0 10	4	2	Vansittarts Saddle, Yel- low Sea.	4 20	10	8
Turon B., Cochin China	3 0	4		Vao Port, Isle of Pines, New Caledonia.	8 6	4	
Tuticorin Harb., G. of Manar, Bay of Bengal, W. Coast.	1 15	2½	1½	Veerre, Netherlands -	1 20	15	
Tutukaka Harbour, New Zealand.	7 0	9	7	Ventry Ireland -	3 44	10½	7
Tweed River (Danger Point), Australia E.C.	9 45	5-8		Venus Harbour, Austr- alia, S. Coast.	2 15	6	
Twofold B., Australia, E.C.	10 0	7	5	Vera Cruz, G. of Mexico		2	
Tylatiap Harb. Java, S.C.	8 45	3½		Verde C., Africa, W. C.	7 45	5	
Tynemouth (Bar), England	8 20	14½	11	Vermilion Bay, G. of Mexico.	irr.	2½	1
Typa Anchorage, China, E. Coast.	10 0	7		Vernon Chan. (Chusan Arch), China, E. Coast	9 40	14	
Uist North (Kallin), Scot- land, W. Coast.	5 59	13½	9½	Versavah, Hindoostan, W. Coast.	12 15	16	
— (Vallay), Scot- land, W. Coast.	6 10	11½	8½	Verte Bay, Nova Scotia	10 0	9	5
— South, (Loch Bois- dale), Scotland W. C.	5 47	12½	9½	Victoria Port, Brazil	3 0	4	
Ullapool, Loch Broom, Scotland.	6 40	14½	10½	— St. Juan de Fuca Strait.	irr.	7-10	
Ummen Nakheilab, Per- sian Gulf.	7 30?	8?		Victoria R., Mosquito Flat, Australia, N.W. Coast.	12 19	15-24	
Underwood Port, New Zealand.	6 10	8	6	— Sandy Island, Australia, N.W. Coast.	1 17	3-10	
Union Bay, La Plata -	3 10	12	9	— Turtle Pt., Australia, N.W. Coast.	7 15	7-13	
Union, Port la, G. of Fonseca, Cent. America.	3 15	10½	8½	Vigo, Spain - -	3 0	12-13	
Upervik, Greenland -	11 0	8		Vin Harbour, G. St. Law- rence.	5 45	5	3
Upstart Bay, Australia, E. Coast.	9 0	6		Vincent, St., Cape, Mada- gascar, W. Coast.	4 45	19	
				— Port St., New Caledonia.	5 50	4½	
				Virgin C., Magellan Strait.	8 30	36-42	
				Vivero, Spain, N. Coast -	3 0	15	
				Vladimir, St., Bay, G. of Tartary.	irr.	3	
				Volcano Ida, China, E. Coast.	11 30	15	7½

	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
White Sea -	11 20	17		West Cove, Kenmare R.,	3 52	10	7½
Id., Færoe	6 0	9½	7½	— Gat, Netherlands -	1 45	7	
(Ceram),	6 0	3		— Hill, Australia, E. C.	10 20	24	
pluccas.				West Quoddy, B. of Fundy	11 12	21	17
New Zea-	9 30	12	9	West River, China, E.			
, Choiseul	6 20	5½		Coast, see Si Kiang.			
d Ida.				Western Port, Australia,	1 10	■	■
yne, Eng-		10½		S. Coast.			
Nova Scotia	10 30	8	5	Westmanshaven, Færoe	6 0	9½	7½
rres Strait	irreg.	7		Ida.			
f, Africa,	1 54	6		Westness, Orkneys -	9 11	10	7½
(entrance),	9 0	15½		Weston-super-mare, Eng-	6 54	37	29½
oast,				land.			
ity), China,	9 30	15½		Westport, Ireland -	4 57	12½	9½
New Zea-	10 15	8	6	Wexford, Ireland -	7 21	5	3½
, New Zea-	11 20	7	6	Whampon { In March -	1 40	} 7-8	
our, New	7 0	■	7	(Docks), { In April -	1 15		
rbour, New	8 15	7		China { In May & June	0 30		
rbour, New	7 10	9	7	See foot note, p. 169.			
urb., G. of	10 30	5	3	Whitby, England -	3 45	15	11½
e				White Dog Ids., China, E. C.	9 0	18	
ay, River	5 47	14½	10½	Whitehaven, England -	11 14	23½	18½
nd.				— Nova Scotia	8 0	6½	4½
, Australia,		3 4		Wick, Scotland -	11 22	10	7½
Carling-	11 10	14½	12	Wicklow, Ireland -	10 29	9	6½
ugh Foyle,	6 20	6½	5	Wide Bay, Australia, E. C.	9 0	6-8	
nited States	9 0	3	2½	Widewall, Orkneys -	9 3	10	7½
idge), Ire-	6 6	13½	10½	Wigton, Scotland -	11 30		
Duncannon	5 20	12½	10	William Pt., Falkland Ids.	5 15	7	5½
frica, S. Cat.	4 0	6		— New Zealand	12 45	8	6
Tierra del	2 0	5		— Scotland, W. C.	11 10	18	10
Harbour,	9 30	9		Willis Islets, Australia,	8 0	6	
R. Tamar,	6 17	5½	1½	E. Coast.			
Patagonia,	0 50	7½		Willoughby Cape, Kan-	4 10	6	
Australia,	7 30	8-12		garoo Id., Australia.			
ted States	11 5	13½	12	Wilmington, United States	9 6	3	2½
—	7 0	12		Wilson Promontory, Aus-	2 0	10	
igland -	6 20	18		tralia, S. Coast.			
, Galapagos	2 10			Winter Harb., Melville Id.	1 30	3½	
ight vessel),	11 30			Winterton Ridge, England	7 50		
				Wisbeach, England -	7 30	15	
				Wisbeach Eye, England		20	
				Wivenhoe, Colne River,	12 10	15	III
				England.			
				Wolstenholme Sound,	11 8	7½	
				Arctic Regions.			
				Woodbridge Haven (Bar),	11 45	12	II
				England.			
				— (Kingston	0 35	10	
				Quay), England.			
				Woodbridge, (Wilford	0 55	7	
				Bridge), England.			
				Woodlark Id., Louisiade	7 15	4	
				Archip.			
				Woods Hole (entrance	8 34	2	1½
				from Vineyard Sound),			
				United States.			
				— (entrance	7 59	4½	4
				from Buzzard Bay),			
				United States.			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Woolwich, England -	h. m. 1 37	ft. 18½	ft. 15½	Yellaboi, Africa, West Coast.	h. m. 2 10	ft. 10	ft. 8
Workington, England -	11 4	20	15	Yeu, Ile d', France -	3 4	14½	10
Wrabness, Stour River, England.	12 29	12		Ylo Road, Peru -	8 15	6	
Wranger Oog, Germany	12 0	97		Yndependencia B., Peru	4 00	4	
Wrath Cape, Scotland -	7 30	15½		Yoku-hama, Yedo Bay, Japan Sea.	6 0	6½	
Wreck Reef, (Bird Islet) Australia, E. Coast.	8 3	6		York C., Australia, East Coast.	11 35	10	
Wuchu, Si Kiang, China, East Coast.		1-1½		— Factory, Hudson Bay	11 15	10-14	
Wusung River (entrance), Yang-tse-Kiang, China, E. Coast.	0 30	10	10½	— River (Moody's Wharf), United States.	9 35	9½	
— (Pheasant Point)	0 35	13	8	— Road, Magellan St.	2 0	9	
Wynkoops Bay, Java -	5 0	4½	4	Youghal, Ireland -	5 14	12½	10
Yang-tse Kiang (entrance), China, E. Coast.	12 0	15	10	Yung R., Chinhae, China, E. Coast.	11 20	12½	
Yarmouth Haven (Brush) England.		5½	4½	— Ning-po-fu, China, E. Coast.	1 0	9	
— Bay of Fundy	10 9	16	13	Yung-hing Bay, Japan S.	5 20	2½	
— Bridge, England		5	4	Yura Harbour, Japan Sea	6 5	6½	
— Road, England	9 15	6	4	Zambezi River (Pearl Id.), Africa, E. Coast.	4 30	12-13	
—, Isle of Wight, England.	10 0 12 0	7	6½	Zansibar, Africa, E.C. -	5 20	30	
Yealm River, Bigbury Bay, England.	5 37	16½	11½	— (Channel) Africa, E. Coast.	4 15	11	
Yedo Bay, (Yoku-hama) Japan.	6 0	6½	4½	Zebu Port, Filipinas -	12 0	7	
				Zeyla, Africa, E. Coast	7 15	8½	
				Zieriksee, Netherlands -	2 0	11	

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For Her Majesty's Stationery Office.



TIDE TABLES

FOR THE

BRITISH AND IRISH PORTS,

FOR THE YEAR

1865;

ALSO THE TIMES AND HEIGHTS OF HIGH WATER AT FULL AND CHANGE
FOR THE PRINCIPAL PLACES ON THE GLOBE.

COMPUTED BY JOHN BURDWOOD, STAFF COMMANDER, R.N.

~~~~~  
PUBLISHED BY ORDER OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.  
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1864.



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LENSTOWN - - "	9	17	25	33	41	49	57	65	73	81	89	97
ERNESS - - - "	3	11	19	27	35	43	51	59	67	75	83	91
ELDS (NORTH) "	5	13	21	29	37	45	53	61	69	77	85	93
GO BAY - - - "	8	16	24	32	40	48	56	64	72	80	88	96
DERLAND - - "	4	12	20	28	36	44	52	60	68	76	84	92
JRSO - - - - "	5	13	21	29	37	45	53	61	69	77	85	93
TERFORD - - "	9	17	25	33	41	49	57	65	73	81	89	97
STON-SUPER-MARE	7	15	23	31	39	47	55	63	71	79	87	95

NOTICE.

If it be desired to reduce the Mean Time at any Place to that of Greenwich (or Railway) Time, (which latter is used in the Tide Tables, published in Liverpool and Glasgow,) the following correction must be applied to the Time given in these Tables :—

				Minutes.
Brest	-	-	-	+ 18
Devonport		-	-	+ 17
Portsmouth		-	-	+ 4
Dover	-	-	-	— 5
Sheerness		-	-	— 3
Harwich	-	-	-	— 5
Hull	-	-	-	+ 1
Sunderland		-	-	+ 5
North Shields		-	-	+ 6
Leith	-	-	-	+ 13
Thurso	-	-	-	+ 14
Greenock	-	-	-	+ 19
Liverpool		-	-	+ 12
Pembroke	-	-	-	+ 20
Weston-super-mare		-	-	+ 12
Holyhead		-	-	+ 18

For the Irish Ports, should Dublin Mean Time be required, the following correction must be applied to the time given in these Tables :—

				Minutes.
Kingstown	-	-	-	— 1
Belfast	-	-	-	— 2
Londonderry		-	-	+ 4
Sligo	-	-	-	+ 9
Galway	-	-	-	+ 11
Queenstown (Cork)		-	-	+ 8
Waterford	-	-	-	+ 3

The above corrections are also given at the foot of each page under the place for which the times and heights of high water are predicted.

ADVERTISEMENT.

the following Tables the time of High Water is given to *Mean* time at Place. Those who are desirous of knowing the *Apparent* time, (or that shown by the Sun,) which High Water occurs, must apply the equation of time, by addition or subtraction, as directed for that purpose.

The height of the tide in these Tables is calculated from the mean level of the lower of ordinary springs, because the soundings expressed in most charts are reduced to that level. The height therefore which is given at each place is the actual rise of the water above the mean low-water level of spring-tides.

In the column of the Moon's transit, (m) stands for morning, and (a) for afternoon.

The Moon's age is given in days, and tenths of a day, from the time of her conjunction, or change; thus, it is New Moon on the 25th of April, at 2 h. 13 m. in the afternoon, and therefore, on the 26th of April, at noon, the moon being 2 h. 47 m. , her age may be accounted as nine tenths of a day, and is expressed by 0.9.

The highest equinoctial tides take place, on the west coast of Ireland and on the north coast of England, three transits after the New and Full Moon, unless diverted by gales of wind or other extraordinary causes. Along the east coast of England, they take place four transits after the New and Full Moon. In the river Thames they take five transits after the same epoch. These differences arise from the cause, that the same tide-wave which produces high water on the west coast of Ireland takes half a day in its progress from thence to the east coast of England, and a whole day before it arrives in the river Thames.

The time of high water at Brest is added for the benefit of vessels navigating the north coast of France and the adjacent sea.

Immediately after the Tide Tables, at page 98, will be found a convenient method of deducing, from them, the height of the tide at any intermediate hour, between high and low water.

The next Table, at page 101, shows the depths on the dock-sills at Falmouth, Devonport, Plymouth, Portsmouth, Sheerness, Chatham, Woolwich, Deptford, London, Hull, Middlesbrough, Hartlepool, Sunderland, Leith, Pembroke, Liverpool, Birkenhead, Dublin, and Londonderry.

In page 103 will be found a collection of Constant Differences, by which the time and height of high water at certain other ports may be approximately found.

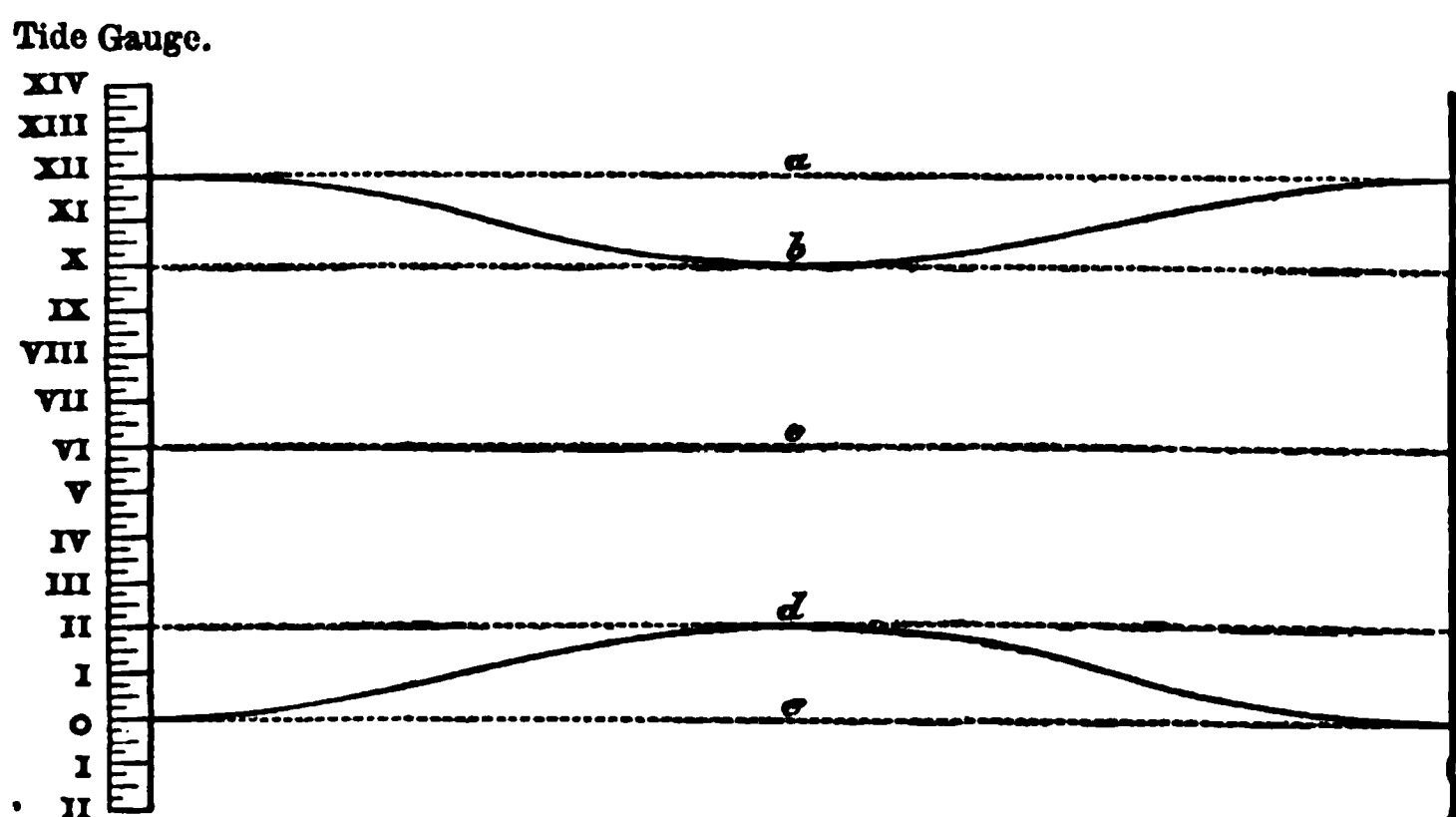
In page 108 a description is given of the general set of the tides in the neighbourhood of several parts of the coast, including a full account of the streams among the Orkneys, and through the Pentland Firth, by Captain F. W. L. Thomas, R. N. and the development, by Rear-Admiral F. W. Beechey, of the movement of the great tide-wave up the English and Irish Channels, and into the North Sea; to which has been added a description of the set of the tides in the vicinity of Rathlin and on the north coast of Ireland by Richard Hoskyn, Staff Commander, R. N.

Lastly, there is appended the time of high water on the days of Full and Change at various places on the globe arranged according to the apparent progress of the tide-wave, and also alphabetically; with the rise of the tide at springs and neaps.

The stations at the several ports where the tidal observations were made on which the predictions in these tables are based, are as follows,—viz :—

Brest, entrance of the basin—Devonport, Dockyard—Portsmouth, Dockyard—Dover, North Pier—Sheerness, Dockyard—London Docks (reduced to London Bridge, the latter being given in these tables, by applying to the times at the docks $+10^m$ and to the heights -4^{ins})—Harwich, Angel Quay—Hull, Victoria Dock—Sunderland, North Dock—North Shields, Low Lighthouse—Leith, East Pier—Thurso, near Scrabster Pier—Greenock, East Dock—Liverpool, St. Georges Pier—Pembroke, Dockyard—Weston-super-mare, Bairnbach Island—Holyhead, Pier—Kingstown, Watering Pier—Belfast, New Dock—Londonderry, Ship Bridge—Sligo Bay, Mullaghmore—Galway, Nimmos Pier—Queenstown, Scott's Wharf—Waterford, Duncannon Fort.

The following diagram is intended to explain the terms Spring Rise, Neap Rise, and Neap Range as made use of on the Admiralty Charts and in the Sailing Directions published by the Admiralty :—



- a = Mean Level of High Water Ordinary Springs.
 b = " " " Neaps.
 c = Half Tide or Mean Level of the sea both at Springs and Neaps.
 d = Mean Level of Low Water Ordinary Neaps.
 e = " " " Springs.

Example.

	ft.
Spring Rise (or Mean Spring Range) = e to a	12
Neap Rise - - - = e to b	10
Neap Range - - - = d to b	8

TIDE TABLES
FOR THE
BRITISH AND IRISH PORTS
FOR THE YEAR
1865.

TIDE TABLES FOR THE

JANUARY, 1865.

WEEK DAY.		MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
				MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			H. M.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
				H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	38	22	5 57	19 5	6 19	19 2	7 51	16 0	8 13	15 2	1 36	12 10	1 59	
Tu.	2	4	14	6 43	18 9	7 8	18 3	8 36	15 7	8 57	14 9	2 21	12 9	2 45	
W.	3	5	6	7 32	17 11	7 57	17 1	9 19	15 0	9 43	14 3	3 9	12 4	3 32	
Th.	4	5	58	8 23	16 5	8 51	15 10	10 8	14 2	10 34	13 7	3 55	11 10	4 20	
F.	5	6	50	9 20	15 4	9 53	15 1	11 1	13 7	11 31	13 1	4 47	11 3	5 15	
S.	6	7	42	10 31	14 11	11 13	14 10	—	—	0 7	13 1	5 46	10 9	6 22	
M.	7	8	36	11 54	15 0	—	—	0 45	12 11	1 23	13 0	7 2	10 6	7 41	
Tu.	8	9	30	0 30	15 2	1 3	15 6	2 1	13 2	2 37	13 3	8 18	10 10	8 54	
W.	9	10	24	1 36	15 11	2 3	16 5	3 11	13 9	3 43	13 10	9 28	11 4	9 57	
Th.	10	11	17	2 28	17 0	2 51	17 5	4 11	14 4	4 37	14 3	10 24	11 9	10 47	
F.	11	morn.		3 13	17 10	3 34	18 1	5 2	14 11	5 26	14 7	11 9	12 1	11 30	
S.	12	0	7	3 54	18 3	4 14	18 4	5 47	15 3	6 7	14 9	11 50	12 3	—	
M.	13	0	56	4 33	18 5	4 50	18 5	6 26	15 5	6 46	14 10	0 10	12 3	0 29	
Tu.	14	1	42	5 7	18 4	5 24	18 3	7 3	15 5	7 19	14 8	0 48	12 3	1 7	
W.	15	2	26	5 40	18 1	5 56	17 10	7 34	15 1	7 48	14 3	1 24	12 2	1 41	
Th.	16	3	9	6 13	17 7	6 29	17 3	8 4	14 7	8 21	13 9	1 58	12 1	2 14	
F.	17	3	51	6 46	16 10	7 3	16 5	8 36	13 11	8 49	13 4	2 30	11 9	2 47	
S.	18	4	33	7 22	15 11	7 42	15 5	9 4	13 4	9 21	12 10	3 4	11 5	3 22	
M.	19	5	15	8 2	14 10	8 23	14 4	9 39	12 9	9 58	12 4	3 41	11 0	4 0	
Tu.	20	6	0	8 46	13 10	9 14	13 6	10 20	12 2	10 45	11 11	4 20	10 6	4 42	
W.	21	6	46	9 48	13 4	10 25	13 3	11 13	11 9	11 47	11 9	5 9	10 0	5 42	
Th.	22	7	35	11 3	13 3	11 44	13 6	—	—	0 25	11 10	6 17	9 9	6 52	
F.	23	8	28	—	—	0 23	13 11	1 4	12 1	1 43	12 2	7 32	9 11	8 11	
S.	24	9	22	0 59	14 7	1 30	15 4	2 21	12 9	2 58	12 11	8 49	10 7	9 21	
M.	25	10	19	1 58	16 2	2 21	17 0	3 33	13 9	4 2	13 9	9 50	11 5	10 16	
Tu.	26	11	17	2 44	17 9	3 7	18 8	4 31	14 9	4 56	14 8	10 40	12 1	11 3	
W.	27	0	14	3 30	19 4	3 52	19 10	5 22	15 7	5 46	15 11	11 26	12 9	11 48	
Th.	28	1	10	4 15	20 3	4 37	20 6	6 10	16 2	6 34	16 0	—	—	0 11	
F.	29	2	5	4 58	20 9	5 20	20 9	6 58	16 7	7 18	16 0	0 34	13 4	0 57	
S.	30	2	59	5 42	20 7	6 4	20 4	7 39	16 6	8 2	15 10	1 20	13 5	1 43	
M.	31	3	53	6 26	20 0	6 48	19 5	8 23	16 2	8 46	15 6	2 6	13 4	2 27	
Half Mean Spring Range.				9ft. 6in.				7ft. 9in.				6ft. 4in.			
Phases of the Moon.								Moon's Declination at Noon.							
First Quarter 4 3 42 Afternoon.								1 7 8.18 9 19 N.38 17 2 8.24 25							
Full - - - - - 11 11 0 Afternoon.								2 2 38 10 19 13 18 6 15 26							
Last Quarter - 20 2 36 Morning.								3 2 N.10 11 17 49 19 9 53 27							
New - - - - - 27 9 30 Morning.								4 6 47 12 15 35 20 13 10 28							
								5 10 59 13 12 39 21 15 57 29							
In Apogee - - 17 6 0 Morning.								6 14 32 14 9 14 22 18 3 30							
In Perigee - - 29 3 0 Morning.								7 17 15 15 5 29 23 19 17 31							
								8 18 58 16 1 34 24 19 29							

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 BREST add 18 m. | DEVONPORT add 17 m. | PORTSMOUTH add 4

JANUARY, 1865.

DOVER.					SHEERNESS.					LONDON.					C's Age At Noon.		
EVENING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.					
Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.		D.	
3 19	2	1 36	19	1	2 44	16	4	3 5 16	4	4 15	19	7	4 37	19	6	3.6	
0 19	0	2 25	18	9	3 27	16	2	3 49	16	0	4 58	19	5	5 20	19	3	4.6
0 18	4	3 13	17	11	4 14	15	10	4 38	15	6	5 43	19	1	6 8	18	9	5.6
6 17	6	4 1	17	0	5 2	15	2	5 27	14	10	6 30	18	5	6 58	18	1	6.6
7 16	6	4 53	15	11	5 55	14	7	6 26	14	3	7 25	17	9	7 55	17	4	7.6
1 15	7	5 52	15	4	6 59	13	11	7 34	13	9	8 26	17	0	9 3	16	9	8.6
9 15	3	7 7	15	5	8 13	13	9	8 54	13	10	9 40	16	7	10 17	16	6	9.6
4 15	8	8 19	16	0	9 32	14	0	10 7	14	2	10 56	16	7	11 33	16	8	10.6
1 16	4	9 20	16	8	10 39	14	5	11 10	14	8	—	—	0	6 16	10	11	11.6
7 17	0	10 12	17	4	11 36	14	10	—	—	0	38	17	1	1 6	17	5	12.6
5 17	7	10 58	17	10	0 1	15	1	0 24	15	4	1 32	17	11	1 55	17	11	0
1 17	11	11 43	18	0	0 46	15	6	1 7	15	8	2 16	18	2	2 36	18	5	14.6
—	0	2 18	2	1	27	15	9	1 46	15	9	2 58	18	7	3 16	18	8	15.6
2 18	2	0 41	18	2	2 4	15	9	2 21	15	8	3 35	18	9	3 51	18	9	16.6
9 18	1	1 18	18	0	2 38	15	8	2 54	15	7	4 8	18	10	4 24	18	9	17.6
6 17	10	1 54	17	8	3 10	15	6	3 26	15	4	4 41	18	8	4 57	18	6	18.6
1 17	6	2 28	17	2	3 43	15	2	3 59	15	0	5 15	18	4	5 31	18	1	19.6
6 16	10	3 4	16	5	4 16	14	9	4 34	14	5	5 48	17	10	6 6	17	7	20.6
2 16	1	3 41	15	8	4 52	14	2	5 12	13	11	6 23	17	4	6 43	17	0	21.6
1 15	3	4 22	14	10	5 34	13	8	5 57	13	4	7 2	16	9	7 24	16	5	22.6
7 14	5	5 17	14	2	6 22	13	1	6 52	12	10	7 48	16	2	8 19	15	10	23.6
8 14	0	6 21	14	0	7 28	12	9	8 6	12	9	8 56	15	8	9 34	15	7	24.6
8 14	3	7 36	14	8	8 44	12	11	9 23	13	2	10 11	15	7	10 48	15	9	25.6
4 15	3	8 46	15	10	10 0	13	6	10 35	13	10	11 27	15	11	—	—	—	26.6
3 16	6	9 39	17	1	11 5	14	4	11 32	14	9	0 2	16	3	0 32	16	9	27.6
4 17	8	10 29	18	3	11 54	15	1	—	—	0	59	17	11	1 24	17	9	28.6
4 18	9	11 19	19	3	0 17	15	6	0 40	15	11	1 47	18	2	2 10	18	8	29.6
3 19	7	—	—	1	3 16	3	1	25	16	7	2 33	19	2	2 55	19	6	1.1
7 19	10	0 31	20	0	1 47	16	10	2 9	16	11	3 18	19	10	3 39	20	1	2.1
5 20	1	1 20	20	0	2 30	17	0	2 51	17	0	3 59	20	11	4 21	20	3	3.1
4 19	10	2 7	19	7	3 13	16	11	3 34	16	9	4 43	20	2	5 5	20	0	4.1
Spring }		9ft. 4in.					8ft. 0in.					9ft. 7in.					

Equation of Time at Noon.

S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
0		9	7 32		17	10 29		25	12 42	
18		10	7 57		18	10 48		26	12 55	
56		11	8 20		19	11 7		27	13 7	
23		12	8 44		20	11 25		28	13 18	
50		13	9 6		21	11 41		29	13 29	
16		14	9 28		22	11 58		30	13 39	
42		15	9 49		23	12 13		31	13 48	
8		16	10 10		24	12 28				

High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 DOVER subtract 5 m. SHEERNESS subtract 3 m. LONDON 0 m.

TIDE TABLES FOR THE

JANUARY, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.
	1	3 22	1 59	11 8	2 22	11 7	8 40	21 4	9 22	21 0	5 30	14 7	5 53	
M.	2	4 14	2 45	11 6	3 8	11 5	9 25	20 10	9 50	20 6	6 16	14 2	6 42	
Tu.	3	5 6	3 32	11 3	3 56	11 1	10 14	20 1	10 38	19 7	7 8	13 8	7 34	
W.	4	5 58	4 18	10 11	4 41	10 9	11 4	19 1	11 35	18 8	7 59	13 0	8 26	
Th.	5	6 50	5 8	10 7	5 37	10 5	—	—	0 10	18 2	8 57	12 4	9 30	
F.	6	7 42	6 6	10 3	6 40	10 2	0 44	17 8	1 16	17 5	10 5	11 10	10 41	
S.	7	8 36	7 21	10 2	8 2	10 2	1 50	17 3	2 27	17 4	11 20	11 8	11 54	
S.	8	9 30	8 39	10 3	9 14	10 5	3 2	17 7	3 35	17 11	—	—	0 26	
M.	9	10 24	9 47	10 7	10 19	10 9	4 8	18 4	4 39	18 9	0 58	12 3	1 29	
Tu.	10	11 17	10 47	10 11	11 13	11 1	5 5	19 1	5 30	19 5	1 58	12 10	2 25	
W.	11	morn.	11 37	11 1	11 59	11 3	5 52	19 8	6 14	19 10	2 49	13 3	3 10	
Th.	12	0 7	—	—	0 20	11 4	6 36	20 0	6 58	20 1	3 30	13 8	3 50	
F.	13	0 56	0 40	11 4	0 59	11 4	7 18	20 3	7 37	20 4	4 9	13 11	4 27	
S.	14	1 42	1 17	11 4	1 35	11 3	7 55	20 3	8 11	20 3	4 44	14 0	5 1	
S.	15	2 26	1 52	11 1	2 9	11 1	8 27	20 2	8 44	20 0	5 18	13 10	5 35	
M.	16	3 9	2 27	11 0	2 44	10 11	9 1	19 9	9 18	19 5	5 52	13 5	6 10	
Tu.	17	3 51	3 1	10 10	3 17	10 8	9 35	19 2	9 52	18 9	6 27	13 0	6 45	
W.	18	4 33	3 34	10 7	3 51	10 5	10 9	18 5	10 28	18 0	7 4	12 6	7 24	
Th.	19	5 15	4 8	10 3	4 27	10 1	10 48	17 8	11 12	17 3	7 44	11 11	8 6	
F.	20	6 0	4 47	9 11	5 9	9 9	11 38	16 10	—	—	8 29	11 4	8 53	
S.	21	6 46	5 32	9 8	6 0	9 7	0 6	16 5	0 37	16 1	9 23	10 10	9 59	
S.	22	7 35	6 34	9 6	7 14	9 6	1 11	15 11	1 45	15 10	10 36	10 8	11 12	
M.	23	8 28	7 52	9 7	8 31	9 9	2 19	15 11	2 53	16 3	11 47	10 11	—	
Tu.	24	9 22	9 7	9 11	9 42	10 2	3 29	16 10	4 4	17 6	0 21	11 3	0 54	
W.	25	10 19	10 13	10 6	10 41	10 9	4 34	18 2	5 1	18 10	1 24	12 2	1 51	
Th.	26	11 17	11 5	11 1	11 28	11 4	5 23	19 5	5 45	20 0	2 17	13 1	2 41	
F.	27	0 14	11 52	11 7	—	—	6 9	20 7	6 33	21 1	3 5	14 0	3 27	
S.	28	1 10	0 16	11 9	0 38	11 11	6 56	21 6	7 18	21 11	3 48	14 9	4 9	
S.	29	2 5	1 0	12 0	1 22	12 1	7 41	22 2	8 3	22 4	4 31	15 4	4 52	
M.	30	2 59	1 44	12 1	2 6	12 1	8 25	22 4	8 47	22 3	5 14	15 5	5 37	
Tu.	31	3 53	2 29	12 0	2 52	11 11	9 9	22 0	9 31	21 6	6 0	15 0	6 23	
Half Mean Spring } Range.			5 ft. 9 in.				10 ft. 5 in.				7 ft. 2 in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°
First Quarter - 4 3 42 Afternoon.							1	7	58.18	9	19	N.38	17	28.24
Full - - - - - 11 11 0 Afternoon.							2	2	38	10	19	13	18	6 15
Last Quarter - 20 2 36 Morning.							3	2	N.10	11	17	49	19	9 53
New - - - - - 27 9 30 Morning.							4	6	47	12	15	35	20	13 10
							5	10	59	13	12	39	21	15 57
In Apogee - - 17 6 0 Morning.							6	14	32	14	9	14	22	18 3
In Perigee - - 29 3 0 Morning.							7	17	15	15	5	29	23	19 17
							8	18	58	16	1	34	24	19 29

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 3

JANUARY, 1865.

NORTH SHIELDS.												LEITH.												THURSO.												C's AGE AT NOON.
MORNING.						AFTERNOON.						MORNING.						AFTERNOON.						MORNING.						AFTERNOON.						
Time.			Height.			Time.			Height.			Time.			Height.			Time.			Height.			Time.			Height.			Time.			Height.			
H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.				
1	5	33	13	3	5	57	13	2	4	28	16	4	4	51	16	3	10	42	13	2	11	6	13	0								3.6				
2	6	20	13	1	6	45	12	10	5	14	16	1	5	40	15	10	11	32	12	8	11	58	12	4								4.6				
3	7	11	12	7	7	36	12	3	6	6	15	6	6	32	15	2	—	—	—	—	0	23	12	0								5.6				
4	8	3	11	10	8	33	11	5	6	58	14	9	7	27	14	4	0	50	11	7	1	19	11	3								6				
5	9	6	11	1	9	40	10	10	8	0	14	0	8	34	13	8	1	51	10	11	2	25	10	7								7.6				
6	10	16	10	9	10	53	10	8	9	10	13	5	9	48	13	4	3	2	10	5	3	44	10	3								8.6				
7	11	32	10	9	—	—	—	—	10	26	13	4	11	1	13	5	4	25	10	2	5	2	10	2								9.6				
8	0	8	10	10	0	40	11	0	11	33	13	7	—	—	—	—	5	35	10	3	6	6	10	6								10.6				
9	1	10	11	2	1	39	11	4	0	5	13	10	0	33	14	1	6	34	10	10	6	58	11	4								11.6				
10	2	5	11	7	2	29	11	11	0	59	14	6	1	24	14	10	7	20	11	9	7	39	12	1								12.6				
11	2	51	12	2	3	11	12	5	1	47	15	2	2	8	15	5	7	58	12	5	8	17	12	8								13.6				
12	3	31	12	7	3	51	12	8	2	29	15	8	2	49	15	9	8	37	12	9	8	55	12	10								14.6				
13	4	10	12	9	4	28	12	10	3	7	15	10	3	24	15	10	9	12	12	10	9	30	12	9								15.6				
14	4	46	12	9	5	4	12	8	3	41	15	9	3	58	15	8	9	48	12	8	10	5	12	6								16.6				
15	5	21	12	6	5	38	12	5	4	15	15	6	4	33	15	5	10	23	12	4	10	41	12	2								17.6				
16	5	56	12	3	6	14	12	1	4	51	15	3	5	8	15	0	10	59	11	11	11	17	11	8								18.6				
17	6	30	11	11	6	48	11	8	5	25	14	10	5	43	14	7	11	35	11	4	11	54	11	1								19.6				
18	7	6	11	5	7	25	11	2	6	2	14	3	6	22	13	11	—	—	—	—	0	13	10	9								20.6				
19	7	47	10	10	8	10	10	6	6	43	13	7	7	5	13	3	0	35	10	5	0	57	10	2								21.6				
20	8	35	10	2	9	2	9	11	7	30	12	11	7	56	12	8	1	21	9	10	1	47	9	7								22.6				
21	9	34	9	8	10	12	9	7	8	27	12	4	9	4	12	3	2	18	9	4	2	56	9	2								23.6				
22	10	48	9	7	11	24	9	9	9	42	12	2	10	18	12	2	3	37	9	1	4	16	9	1								24.6				
23	12	0	9	11	—	—	—	—	10	53	12	5	11	28	12	9	4	54	9	3	5	30	9	5									25.6			
24	0	35	10	3	1	7	10	7	—	—	—	—	0	1	13	2	6	3	9	10	6	31	10	5									26.6			
25	1	35	11	0	2	0	11	6	0	29	13	9	0	53	14	3	6	54	11	1	7	14	11	8									27.6			
26	2	22	11	11	2	44	12	5	1	16	14	10	1	39	15	5	7	33	12	4	7	53	12	11									28.6			
27	3	6	12	11	3	27	13	4	2	2	16	0	2	25	16	5	8	12	13	6	8	34	13	10									29.6			
28	3	48	13	8	4	10	14	0	2	47	16	10	3	7	17	2	8	55	14	1	9	17	14	3									30.6			
29	4	32	14	2	4	54	14	2	3	28	17	4	3	50	17	4	9	39	14	4	10	2	14	3									31.6			
30	5	17	14	1	5	41	14	0	4	12	17	3	4	35	17	1	10	25	14	1	10	49	13	11									32.6			
31	6	4	13	10	6	27	13	7	4	58	16	11	5	20	16	8	11	12	13	7	11	37	13	2									33.6			
Mean Spring Range. } 6ft. 8in.												8ft. 2in.												6ft. 7in.												

Equation of Time at Noon.

M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
4	0		9	7	32		17	10	29		25	12	42		25	12	42	
4	28		10	7	57		18	10	48		26	12	55		26	12	55	
4	56		11	8	20		19	11	7		27	13	7		27	13	7	
5	23		12	8	44		20	11	25		28	13	18		28	13	18	
5	50		13	9	6		21	11	41		29	13	29		29	13	29	
6	16		14	9	28		22	11	58		30	13	39		30	13	39	
6	42		15	9	49		23	12	13		31	13	48		31	13	48	
7	8		16	10	10		24	12	28									

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

TIDE TABLES FOR THE

JANUARY, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
M.	1	3 22	2 1	9 11	2 24	9 11	1 12	26 6	1 35	26 3	8 25	21 3	8 48	21 1	
Tu.	2	4 14	2 46	9 10	3 10	9 9	1 56	25 11	2 20	25 6	9 12	20 9	9 35	20 5	
W.	3	5 6	3 33	9 8	3 55	9 6	2 43	25 0	3 6	24 5	9 56	19 9	10 17	19 1	
Th.	4	5 58	4 19	9 5	4 44	9 3	3 30	23 10	3 55	23 2	10 41	18 8	11 5	17 1	
F.	5	6 50	5 12	9 1	5 40	8 10	4 26	22 6	4 58	21 10	11 29	17 3	11 57	16 1	
1	6	7 42	6 12	8 8	6 48	8 7	5 34	21 6	6 14	21 4	—	—	0 29	16 1	
2	7	8 36	7 28	8 6	8 6	8 7	6 57	21 5	7 35	21 7	1 11	16 6	1 54	16 1	
3	8	9 30	8 42	8 8	9 16	8 9	8 10	21 11	8 42	22 4	2 33	16 11	3 11	17 1	
M.	9	10 24	9 49	8 10	10 18	9 0	9 12	22 10	9 38	23 4	3 45	17 10	4 17	18 1	
Tu.	10	11 17	10 44	9 1	11 9	9 2	10 3	23 10	10 25	24 2	4 46	18 10	5 12	19 1	
W.	11	morn.	11 32	9 3	11 56	9 4	10 46	24 6	11 8	24 9	5 36	19 7	6 0	19 1	
Th.	12	0 7	—	—	0 18	9 5	11 29	25 0	11 49	25 2	6 22	20 1	6 41	20 1	
F.	13	0 56	0 38	9 6	0 56	9 6	—	—	0 8	25 3	6 59	20 4	7 16	20 1	
1	14	1 42	1 15	9 6	1 33	9 6	0 26	25 3	0 43	25 3	7 33	20 3	7 50	20 1	
2	15	2 26	1 50	9 6	2 6	9 6	1 0	25 1	1 17	24 11	8 7	20 0	8 24	19 1	
M.	16	3 9	2 23	9 5	2 40	9 4	1 34	24 6	1 49	24 2	8 41	19 6	8 57	19 1	
Tu.	17	3 51	2 55	9 3	3 11	9 2	2 5	23 9	2 22	23 4	9 14	18 10	9 30	18 1	
W.	18	4 33	3 28	9 1	3 45	9 0	2 39	22 11	2 56	22 5	9 46	17 11	10 4	17 1	
Th.	19	5 15	4 4	8 10	4 24	8 9	3 15	21 11	3 35	21 4	10 22	17 0	10 41	16 1	
F.	20	6 0	4 45	8 7	5 7	8 5	3 57	20 9	4 21	20 3	11 0	15 11	11 23	15 1	
1	21	6 46	5 34	8 3	6 8	8 2	4 51	19 9	5 28	19 7	11 53	15 2	—	—	
2	22	7 35	6 43	8 1	7 18	8 0	6 7	19 6	6 47	19 8	0 25	15 0	1 0	15 1	
M.	23	8 28	7 57	8 1	8 35	8 3	7 27	20 0	8 4	20 6	1 43	15 3	2 25	15 1	
Tu.	24	9 22	9 11	8 6	9 43	8 8	8 39	21 3	9 8	22 2	3 4	16 4	3 38	17 1	
W.	25	10 19	10 11	8 11	10 36	9 1	9 34	23 1	9 56	23 11	4 9	18 1	4 36	18 1	
Th.	26	11 17	11 0	9 3	11 26	9 6	10 18	24 8	10 41	25 5	5 3	19 8	5 30	20 1	
F.	27	0 14	11 51	9 8	—	—	11 6	26 1	11 27	26 9	5 56	21 1	6 19	21 1	
S.	28	1 10	0 15	9 11	0 38	10 1	11 49	27 3	—	—	6 41	22 2	7 3	22 1	
1	29	2 5	1 1	10 2	1 24	10 3	0 12	27 7	0 35	27 10	7 25	22 8	7 47	22 1	
M.	30	2 59	1 46	10 3	2 9	10 3	0 57	27 10	1 20	27 9	8 9	22 6	8 32	22 1	
Tu.	31	3 53	2 31	10 3	3 52	10 2	1 42	27 5	2 3	26 10	8 54	21 10	9 17	21 1	
Half Mean Spring Range.			4 ft. 10 in.				13 ft. 0 in.				10 ft. 6 in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	0	1	M.D.	0	1	M.D.	0	1
First Quarter - 4 3 42 Afternoon.							1	7	3.18	9	19	N.38	17	2	3.24
Full - 11 11 0 Afternoon.							2	2	38	10	19	13	18	6	15
Last Quarter - 20 2 36 Morning.							3	2	N.10	11	17	49	19	9	53
New - 27 9 30 Morning.							4	6	47	12	15	35	20	13	10
							5	10	59	13	12	39	21	15	57
In Apogee - 17 6 0 Morning.							6	14	32	14	9	14	22	18	3
In Perigee - 29 3 0 Morning.							7	17	15	15	5	29	23	19	17
							8	18	58	16	1	34	24	19	29

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
 GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

JANUARY, 1865.

DAY.	MONTH.	DAY.	WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
			Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.								
1	9	6	38	0	9	27	37	9	—	—	0	23	16	1	1	2	11	0	1	25	10	11	3.6				
2	9	48	37	2	10	10	36	5	0	48	15	11	1	14	15	8	1	49	10	9	2	14	10	7	4.6		
3	10	27	35	7	10	46	34	7	1	40	15	4	2	5	15	0	2	40	10	5	3	5	10	3	5.6		
4	11	8	33	7	11	33	32	7	2	31	14	8	3	0	14	4	3	30	10	1	3	58	9	11	6		
5	12	0	31	7	—	—	—	—	3	32	14	0	4	6	13	8	4	31	9	8	5	4	9	5	7.6		
6	0	32	30	11	1	7	30	6	4	43	13	6	5	21	13	5	5	37	9	4	6	10	9	3	8.6		
7	1	48	30	4	2	28	30	5	6	0	13	5	6	35	13	6	6	47	9	4	7	22	9	5	9.6		
8	3	7	30	9	3	45	31	3	7	7	13	8	7	38	13	10	7	55	9	6	8	28	9	8	10.6		
9	4	23	32	0	4	56	32	10	8	8	14	2	8	34	14	5	9	1	9	10	9	31	10	0	11.6		
10	5	27	33	8	5	53	34	4	8	58	14	8	9	20	14	11	9	58	10	2	10	20	10	3	12.6		
11	6	18	34	10	6	42	35	3	9	41	15	2	10	2	15	3	10	39	10	5	10	59	10	7	13.6		
12	7	4	35	7	7	24	35	11	10	22	15	5	10	40	15	6	11	19	10	8	11	38	10	9	14.6		
13	7	43	36	3	8	0	36	2	10	56	15	7	11	12	15	6	11	56	10	9	—	—	—	—	15.6		
14	8	17	36	2	8	33	36	0	11	29	15	5	11	46	15	4	0	14	10	8	0	32	10	7	16.6		
15	8	49	35	10	9	5	35	6	—	—	—	—	0	4	15	3	0	49	10	6	1	7	10	5	17.6		
16	9	20	35	2	9	35	34	8	0	22	15	1	0	40	14	10	1	25	10	4	1	42	10	2	18.6		
17	9	49	34	1	10	4	33	5	0	58	14	8	1	17	14	4	1	59	10	0	2	17	9	11	19.6		
18	10	18	32	8	10	33	31	11	1	36	14	1	1	55	13	10	2	36	9	9	2	55	9	7	20.6		
19	10	50	31	1	11	8	30	2	2	16	13	6	2	38	13	3	3	15	9	5	3	37	9	3	21.6		
20	11	28	29	4	11	54	28	7	3	2	12	11	3	28	12	7	4	0	9	1	4	26	8	11	22.6		
21	—	—	—	—	0	27	28	1	3	59	12	4	4	37	12	3	4	57	8	9	5	32	8	8	23.6		
22	1	2	27	9	1	38	27	10	5	15	12	3	5	51	12	4	6	6	8	8	6	40	8	9	24.6		
23	2	17	28	2	2	57	28	10	6	27	12	7	7	2	12	10	7	14	8	11	7	49	9	1	25.6		
24	3	37	29	10	4	14	31	0	7	35	13	3	8	4	13	9	8	24	9	4	8	55	9	7	26.6		
25	4	48	32	4	5	17	33	8	8	30	14	3	8	52	14	9	9	24	9	11	9	50	10	2	27.6		
26	5	44	34	11	6	11	36	3	9	14	15	3	9	36	15	8	10	13	10	5	10	34	10	9	28.6		
27	6	37	37	3	7	1	38	2	9	58	16	1	10	20	16	6	10	56	11	0	11	17	11	3	29.6		
28	7	24	39	0	7	46	39	8	10	40	16	9	11	0	17	0	11	38	11	5	12	0	11	6	30.6		
29	8	8	40	0	8	30	40	0	11	20	17	1	11	42	17	1	—	—	—	—	0	23	11	6	31.6		
30	8	52	39	11	9	13	39	7	—	—	—	—	0	6	17	0	0	46	11	6	1	9	11	5	32.6		
31	9	33	39	0	9	53	38	3	0	30	16	10	0	54	16	6	1	33	11	3	1	56	11	1	33.6		
Half Mean Spring Range.		18ft. 7in.								8ft. 0in.								5ft. 6in.									

Equation of Time at Noon.

D.	M.	S.	Sub.	M.	D.	M.	S.	Sub.	M.	D.	M.	S.	Sub.	M.	D.	M.	S.	Sub.
1	4	0		9	7	32		17	10	29		25	12	42		25	12	42
2	4	28		10	7	57		18	10	48		26	12	55		26	12	55
3	4	56		11	8	20		19	11	7		27	13	7		27	13	7
4	5	23		12	8	44		20	11	25		28	13	18		28	13	18
5	5	50		13	9	6		21	11	41		29	13	29		29	13	29
6	6	16		14	9	28		22	11	58		30	13	39		30	13	39
7	6	42		15	9	49		23	12	13		31	13	48		31	13	48
8	7	8		16	10	10		24	12	28								

times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time

TIDE TABLES FOR THE

JANUARY, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.						
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.				
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.			
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.			
A.	1	3 22	0 38	9 7	1 2	9 6	10 7	7 7	10 28	7 6	7 29	11 0	7 52	10 10			
M.	2	4 14	1 27	9 5	1 53	9 4	10 53	7 4	11 20	7 1	8 16	10 7	8 41	10 1			
Tu.	3	5 6	2 21	9 3	2 47	9 1	11 49	6 10	—	—	9 6	10 0	9 35	9 5			
W.	4	5 58	3 14	8 11	3 42	8 10	0 21	6 7	0 57	6 4	10 6	9 6	10 40	9 3			
Th.	5	6 50	4 13	8 8	4 45	8 6	1 37	6 2	2 17	6 1	11 15	9 1	11 50	9 0			
F.	6	7 42	5 17	8 5	5 51	8 4	2 54	6 1	3 29	6 3	—	—	0 26	8 11			
S.	7	8 36	6 30	8 3	7 7	8 3	4 4	6 4	4 35	6 6	1 4	8 11	1 40	9 8			
A.	8	9 30	7 41	8 4	8 13	8 5	5 2	6 7	5 28	6 8	2 14	9 1	2 45	9 3			
M.	9	10 24	8 42	8 7	9 8	8 10	5 53	6 9	6 18	6 11	3 13	9 6	3 38	9 10			
Tu.	10	11 17	9 33	9 0	9 56	9 1	6 43	7 0	7 7	7 2	4 0	10 1	4 22	10 8			
W.	11	morn.	10 17	9 2	10 38	9 3	7 29	7 3	7 52	7 4	4 43	10 6	5 5	10 8			
Th.	12	0 7	10 58	9 3	11 17	9 3	8 12	7 5	8 30	7 6	5 27	10 10	5 46	10 10			
F.	13	0 56	11 34	9 3	11 50	9 3	8 47	7 6	9 2	7 5	6 4	10 11	6 20	10 10			
S.	14	1 42	—	—	0 7	9 3	9 18	7 4	9 34	7 3	6 37	10 9	6 55	10 8			
A.	15	2 26	0 25	9 3	0 43	9 2	9 50	7 2	10 6	7 0	7 12	10 6	7 29	10 5			
M.	16	3 9	1 1	9 1	1 19	9 0	10 22	6 11	10 38	6 9	7 46	10 1	8 2	9 10			
Tu.	17	3 51	1 37	8 11	1 56	8 11	10 55	6 7	11 15	6 5	8 18	9 7	8 36	9 4			
W.	18	4 33	2 16	8 10	2 37	8 8	11 38	6 2	—	—	8 56	9 1	9 18	8 12			
Th.	19	5 15	2 58	8 6	3 20	8 5	0 3	6 0	0 32	5 9	9 43	8 8	10 9	8 8			
F.	20	6 0	3 44	8 3	4 9	8 2	1 1	5 7	1 33	5 6	10 37	8 3	11 9	8 2			
S.	21	6 46	4 38	8 1	5 13	8 0	2 10	5 5	2 49	5 5	11 44	8 1	—	—			
A.	22	7 35	5 47	7 11	6 21	7 11	3 25	5 7	3 58	5 9	0 19	8 1	0 55	8 2			
M.	23	8 28	6 59	7 11	7 35	8 0	4 30	5 11	4 59	6 1	1 32	8 3	2 8	8 6			
Tu.	24	9 22	8 9	8 2	8 38	8 5	5 26	6 4	5 50	6 7	2 42	8 10	3 9	9 5			
W.	25	10 19	9 3	8 8	9 26	8 11	6 13	6 10	6 36	7 1	3 34	9 8	3 54	10 1			
Th.	26	11 17	9 49	9 2	10 12	9 4	6 59	7 4	7 24	7 7	4 15	10 6	4 38	10 10			
F.	27	0 14	10 34	9 6	10 56	9 8	7 48	7 9	8 10	8 0	5 1	11 3	5 24	11 7			
S.	28	1 10	11 17	9 9	11 38	9 10	8 30	8 2	8 50	8 3	5 46	11 10	6 7	12 0			
A.	29	2 5	11 58	9 10	—	—	9 10	8 3	9 31	8 2	6 28	12 0	6 51	11 14			
M.	30	2 59	0 21	9 10	0 45	9 10	9 53	8 1	10 14	7 11	7 14	11 9	7 37	11 7			
Tu.	31	3 53	1 9	9 9	1 32	9 8	10 35	7 9	10 58	7 7	7 59	11 3	8 21	10 11			
Half Mean Spring } Range.			4 ft. 9 in.				3 ft. 10 in.				5 ft. 7 in.						
Phases of the Moon.						Moon's Declination at Noon.											
D. H. M.						M.D.		° /		M.D.		° /		M.D.		° /	
First Quarter - 4 3 42 Afternoon.						1		7 8. 18		9		19 N. 38		17		2 8. 24	
Full - - - - 11 11 0 Afternoon.						2		2 38		10		19 13		18		6 15	
Last Quarter - 20 2 36 Morning.						3		2 N. 10		11		17 49		19		9 53	
New - - - - 27 9 30 Morning.						4		6 47		12		15 35		20		13 10	
						5		10 59		13		12 39		21		15 57	
						6		14 32		14		9 14		22		18 3	
In Perigee - - 17 6 0 Morning.						7		17 15		15		5 29		23		19 17	
In Apogee - - 29 3 0 Morning.						8		18 58		16		1 34		24		19 29	

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required.

BELFAST subtract 3 m.

LONDONDERRY add 4 m.

SLIGO BAY add 1 m.

JANUARY, 1865.

GALWAY.					QUEENSTOWN.					WATERFORD.					C's AGE AT NOON.	
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.				
Time. H. M. P.	Height. F. I.	Time. H. M. P.	Height. F. I.		Time. H. M. P.	Height. F. I.	Time. H. M. P.	Height. F. I.		Time. H. M. P.	Height. F. I.	Time. H. M. P.	Height. F. I.			
1 6 51	15 0	7 14	14 10		7 17	11 11	7 39	11 9		7 38	12 9	8 0	12 8	3.6		
2 7 39	14 6	8 5	14 2		8 3	11 7	8 26	11 4		8 22	12 6	8 44	12 4	4.6		
3 8 30	13 9	8 55	13 3		8 46	11 1	9 8	10 9		9 3	12 1	9 24	11 10	5.6		
4 9 22	12 9	9 52	12 4		9 33	10 6	9 58	10 3		9 47	11 6	10 15	11 2	6.6		
5 10 24	12 0	10 58	11 10		10 25	10 0	10 57	9 9		10 46	10 10	11 18	10 7	7.6		
6 11 36	11 8	—	—		11 33	9 8	—	—		11 51	10 5	—	—	8.6		
7 0 16	11 9	0 52	11 10		0 14	9 7	0 52	9 8		0 27	10 4	1 3	10 5	9.6		
8 1 25	12 0	1 56	12 3		1 30	9 9	2 7	9 11		1 39	10 6	2 16	10 8	10.6		
9 2 25	12 6	2 53	12 10		2 41	10 2	3 11	10 4		2 53	10 11	3 26	11 2	11.6		
0 3 20	13 2	3 42	13 5		3 38	10 7	4 3	10 10		3 56	11 5	4 22	11 7	12.6		
1 4 3	13 6	4 25	13 11		4 26	11 0	4 48	11 2		4 47	11 9	5 11	11 10	13.6		
2 4 45	14 1	5 4	14 3		5 10	11 3	5 30	11 4		5 33	11 11	5 51	12 0	14.6		
3 5 22	14 4	5 40	14 4		5 49	11 5	6 7	11 5		6 9	12 1	6 28	12 1	15.6		
4 5 58	14 3	6 16	14 2		6 25	11 5	6 42	11 4		6 46	12 1	7 3	12 1	16.6		
5 6 33	14 0	6 50	13 10		6 59	11 3	7 16	11 2		7 20	12 0	7 37	11 11	17.6		
6 7 7	13 7	7 24	13 4		7 32	11 0	7 48	10 18		7 53	11 10	8 8	11 9	18.6		
7 7 42	13 1	8 1	13 9		8 4	10 7	8 20	10 5		8 23	11 7	8 38	11 5	19.6		
8 8 20	12 4	8 40	12 0		8 36	10 2	8 55	10 0		8 54	11 2	9 11	11 0	20.6		
9 9 1	11 7	9 23	11 2		9 14	9 9	9 33	9 6		9 28	10 9	9 47	10 6	21.6		
0 9 47	10 10	10 17	10 7		9 53	9 3	10 18	9 0		10 10	10 3	10 40	9 11	22.6		
1 10 53	10 6	11 30	10 5		10 52	8 11	11 28	8 10		11 14	9 9	11 47	9 7	23.6		
2 —	—	0 7	10 6		—	—	0 4	8 10		—	—	0 21	9 7	24.6		
3 0 44	10 9	1 20	11 1		0 42	9 0	1 21	9 2		0 55	9 9	1 31	9 11	25.6		
4 1 53	11 7	2 21	12 1		2 1	9 6	2 34	9 10		2 9	10 3	2 45	10 8	26.6		
5 2 48	12 8	3 12	13 2		3 3	10 3	3 30	10 8		3 18	11 0	3 46	11 5	27.6		
6 3 35	13 9	3 58	14 3		3 55	11 0	4 20	11 5		4 14	11 9	4 41	12 2	28.6		
7 4 21	14 9	4 43	15 3		4 44	11 9	5 7	12 1		5 7	12 5	5 30	12 8	29.6		
8 5 5	15 8	5 27	15 11		5 30	12 4	5 53	12 6		5 52	12 11	6 14	13 2	30.6		
9 5 49	16 1	6 12	16 0		6 16	12 7	6 38	12 7		6 36	13 3	6 59	13 3	31.6		
0 6 35	15 11	6 58	15 9		7 1	12 6	7 24	12 5		7 22	13 3	7 45	13 3	32.6		
1 7 21	15 5	7 44	15 0		7 46	12 2	8 8	11 11		8 6	13 1	8 27	12 10	33.6		
At Mean Spring } Range.					7 ft. 5 in.					5 ft. 10 in.					6 ft. 2 in.	

Equation of Time at Noon.

M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
4	0		9	7	32		17	10	29		25	12	42	
4	28		10	7	57		18	10	48		25	12	55	
4	56		11	8	20		19	11	7		27	13	7	
5	23		12	8	44		20	11	25		28	13	18	
5	50		13	9	6		21	11	41		29	13	29	
6	16		14	9	28		22	11	58		30	13	39	
6	42		15	9	49		23	12	13		31	13	48	
7	8		16	10	10		24	12	28					

Times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
 GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.

FEBRUARY, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.
W.	1	48.46	7 11 18 9	7 35 17 11	9 7 15 7	9 27 14 10	2 50 12 11	3 12 1						
Th.	2	5 39	7 59 17 0	8 23 16 2	9 49 14 8	10 12 14 0	3 35 12 3	3 58 1						
F.	3	6 33	8 51 15 4	9 21 14 9	10 36 13 7	11 3 13 3	4 21 11 5	4 47 1						
S.	4	7 27	9 59 14 3	10 40 14 0	11 34 12 9	— —	5 17 10 7	5 52 1						
S.	5	8 20	11 27 13 11	— —	0 8 12 8	0 47 12 4	6 31 10 2	7 16 1						
M.	6	9 12	0 10 14 0	0 48 14 4	1 28 12 8	2 8 12 6	7 57 10 2	8 37 1						
Tu.	7	10 3	1 21 14 10	1 52 15 5	2 48 13 2	3 22 13 0	9 12 10 9	9 41 1						
W.	8	10 51	2 18 16 0	2 41 16 7	3 53 13 11	4 21 13 8	10 12 11 4	10 36 1						
Th.	9	11 38	3 0 17 1	3 19 17 8	4 45 14 7	5 8 14 2	10 56 11 9	11 15 1						
F.	10	morn.	3 38 18 0	3 56 18 3	5 29 15 0	5 49 14 6	11 34 12 1	11 52 1						
S.	11	0 22	4 12 18 6	4 29 18 7	6 7 15 3	6 24 14 9	— —	0 8 1						
S.	12	1 6	4 45 18 8	5 0 18 8	6 41 15 5	6 58 14 10	0 25 12 5	0 43 1						
M.	13	1 48	5 16 18 7	5 32 18 5	7 12 15 3	7 26 14 8	0 59 12 4	1 16 1						
Tu.	14	2 30	5 46 18 3	6 0 18 0	7 40 14 10	7 53 14 4	1 32 12 3	1 47 1						
W.	15	3 12	6 15 17 8	6 31 17 3	8 8 14 4	8 24 13 10	2 2 12 1	2 17 1						
Th.	16	3 55	6 48 16 10	7 5 16 4	8 39 13 8	8 52 13 5	2 33 11 9	2 49 1						
F.	17	4 40	7 23 15 9	7 43 15 2	9 6 13 2	9 23 12 10	3 5 11 5	3 23 1						
S.	18	5 27	8 4 14 6	8 28 13 11	9 43 12 7	10 4 12 4	3 42 10 11	4 2 1						
S.	19	6 17	8 58 13 6	9 32 13 2	10 30 12 0	11 0 12 0	4 25 10 4	4 54 1						
M.	20	7 9	10 12 13 1	10 55 13 2	11 33 11 8	— —	5 26 9 10	6 4						
Tu.	21	8 3	11 41 13 6	— —	0 13 12 0	0 57 11 10	6 45 9 8	7 29						
W.	22	8 59	0 24 14 1	1 1 14 11	1 41 12 7	2 22 12 6	8 11 10 3	8 51 1						
Th.	23	9 55	1 32 15 9	2 0 16 9	3 1 13 7	3 36 13 7	9 23 11 3	9 52 1						
F.	24	10 52	2 26 17 9	2 48 18 9	4 6 14 9	4 34 14 3	10 20 12 2	10 44 1						
S.	25	11 48	3 9 19 8	3 31 20 5	5 1 15 8	5 27 15 6	11 6 13 0	11 27 1						
S.	26	08.44	3 53 20 11	4 15 21 3	5 50 16 5	6 14 16 2	11 49 13 7	—						
M.	27	1 40	4 37 21 5	5 0 21 5	6 38 16 11	7 1 16 7	0 12 13 9	0 35 1						
Tu.	28	2 35	5 22 21 4	5 44 21 0	7 22 16 10	7 43 16 4	0 59 13 9	1 22 1						

Half Mean Spring }
Range.

9ft. 6in.

7ft. 9in.

6ft. 4in.

Phases of the Moon.

	D.	H.	M.	
First Quarter-	3	1	9	Morning.
Full - - - - -	10	4	27	Afternoon.
Last Quarter -	18	9	38	Afternoon.
New - - - - -	25	8	3	Afternoon.
In Apogee - -	13	9	0	Afternoon.
In Perigee - -	26	0	0	Noon.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	9	N.45	9	13	N.33	17	14	8.51	25	6	
2	13	32	10	10	20	18	17	9	26		
3	16	28	11	6	43	19	1	41	27		
4	18	26	12	2	52	20	19	18	28		
5	19	22	13	1	S. 3	21	1	53			
6	19	16	14	4	55	22	17	21			
7	18	11	15	8	36	23	14	41			
8	16	14	16	11	57	24	11	2			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required

BREST add 18 m.

1

DEVONPORT add 17 m.

1

PORTSMOUTH add 4 m.

FEBRUARY, 1865.

DOVER.						SHEERNESS.						LONDON.						C's Age at Noon.					
MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.								
me. M. F. I.	Height. F. I.		Time. H. M. F. I.	Height. F. I.		Time. H. M. F. I.	Height. F. I.		Time. H. M. F. I.	Height. F. I.		Time. H. M. F. I.	Height. F. I.		Time. H. M. F. I.	Height. F. I.			D.				
30	19	3	2	53	18	9	3	56	16	6	4	19	16	2	5	27	19	9	5	49	19	6	5.1
16	18	1	3	39	17	5	4	41	15	9	5	5	15	3	6	12	19	1	6	37	18	7	6.1
2	16	9	4	27	16	1	5	29	14	10	5	55	14	5	7	0	18	0	7	24	17	6	7.1
54	15	5	5	27	14	11	6	26	14	0	7	0	13	6	7	54	17	1	8	29	16	7	8.1
2	14	7	6	42	14	6	7	39	13	4	8	22	13	3	9	8	16	3	9	48	16	0	9.1
23	14	9	8	3	15	1	9	7	13	4	9	48	13	6	10	31	15	11	11	15	16	0	10.1
37	15	0	9	7	15	11	10	25	13	9	10	57	14	0	11	53	16	2	—	—	—	—	11.1
35	16	4	9	59	16	9	11	26	14	4	11	51	14	7	0	28	16	5	0	56	16	9	12.1
21	17	1	10	42	17	5	—	—	—	—	0	13	14	11	1	20	17	1	1	43	17	6	13.1
2	17	9	11	22	18	0	0	33	15	2	0	51	15	4	2	4	17	9	2	23	18	1	14.1
41	18	2	11	59	18	3	1	11	15	7	1	29	15	9	2	40	18	4	2	59	18	7	15.1
—	—	—	0	16	18	4	1	45	15	10	2	1	15	11	3	15	18	9	3	30	18	10	16.1
33	18	4	0	51	18	4	2	17	15	10	2	32	15	10	3	47	18	11	4	1	18	11	17.1
8	18	3	1	24	18	1	2	48	15	9	3	2	15	8	4	18	18	11	4	33	18	10	18.1
40	17	11	1	56	17	9	3	16	15	7	3	30	15	5	4	48	18	9	5	3	18	6	19.1
13	17	5	2	30	17	2	3	45	15	2	4	1	14	11	5	17	18	4	5	32	18	1	20.1
47	16	9	3	4	16	4	4	18	14	8	4	35	14	5	5	48	17	10	6	6	17	7	21.1
23	15	11	3	43	15	5	4	53	14	1	5	13	13	9	6	23	17	3	6	43	16	11	22.1
6	14	11	4	32	14	6	5	36	13	6	6	2	13	2	7	6	16	6	7	33	16	2	23.1
3	14	1	5	37	13	11	6	34	12	10	7	12	12	8	8	2	15	10	8	37	15	7	24.1
15	13	11	6	55	14	3	7	53	12	8	8	37	12	10	9	20	15	6	10	4	15	6	25.1
37	14	10	8	16	15	6	9	20	13	2	10	1	13	7	10	46	15	8	11	28	16	0	26.1
47	16	3	9	15	17	0	10	37	14	0	11	7	14	7	—	—	—	—	0	4	16	6	27.1
43	17	9	10	8	18	5	11	34	15	1	11	59	15	7	0	34	17	0	0	59	17	7	28.1
32	19	1	10	56	19	8	—	—	—	—	0	21	16	1	1	23	18	2	1	49	18	9	29.1
20	20	1	11	45	20	5	0	42	16	6	1	4	16	10	2	13	19	4	2	34	19	10	30.1
—	—	—	0	9	20	7	1	26	17	2	1	48	17	4	2	56	20	2	3	19	20	6	31.1
33	20	8	0	57	20	7	2	9	17	5	2	31	17	5	3	41	20	8	4	1	20	8	32.1
Mean Spring range.			9ft. 4in.			8ft. 0in.			9ft. 7in.														

Equation of Time at Noon.

M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
3 56	Sub.	9	14 31	Sub.	17	14 15	Sub.	25	13 16	Sub.
4 3		10	14 31		18	14 10		26	13 6	
4 9		11	14 31		19	14 4		27	12 55	
4 15		12	14 30		20	13 58		28	12 44	
4 20		13	14 29		21	13 51				
4 24		14	14 26		22	13 43				
4 27		15	14 23		23	13 35				
4 29		16	14 20		24	13 26				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 DOVER subtract 5 m. SHEERNESS subtract 3 m. LONDON 0 m.

TIDE TABLES FOR THE

FEBRUARY, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time. Height.	Time. Height.	Time. Height.	Time. Height.	Time. Height.	Time. Height.	Time. Height.	Time. Height.	Time. Height.	Time. Height.	Time. Height.	Time. Height.
		H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.
W.	1	4 46	3 14 11 8	3 37 11 6	9 54 21 0	10 17 20 6	6 47 14 4	7 11 13 11						
Th.	2	5 39	3 59 11 3	4 21 11 0	10 41 19 9	11 6 19 1	7 36 13 6	8 1 12 11						
F.	3	6 33	4 43 10 9	5 9 10 6	11 36 18 5	— — — —	8 28 12 5	8 58 12 0						
S.	4	7 27	5 37 10 3	6 7 10 0	0 9 17 9	0 45 17 2	9 31 11 7	10 10 11 4						
	5	8 20	6 45 9 11	7 30 9 10	1 22 16 9	1 59 16 6	10 50 11 1	11 32 11 1						
M.	6	9 12	8 15 9 10	8 55 9 11	2 39 16 7	3 17 16 10	— — — —	0 10 11 3						
Tu.	7	10 3	9 32 10 1	10 4 10 3	3 53 17 3	4 26 17 9	0 44 11 6	1 16 11 11						
W.	8	10 51	10 35 10 6	11 2 10 8	4 55 18 3	5 20 18 8	1 45 12 3	2 13 12 7						
Th.	9	11 38	11 25 10 11	11 46 11 1	5 42 19 0	6 1 19 4	2 37 12 10	2 58 13 1						
F.	10	morn.	— — — —	0 5 11 2	6 21 19 8	6 41 19 11	3 16 13 4	3 34 13 7						
S.	11	0 22	0 24 11 3	0 42 11 4	7 0 20 2	7 16 20 4	3 51 13 10	4 8 14 0						
	12	1 6	0 57 11 5	1 13 11 5	7 32 20 5	7 49 20 6	4 24 14 1	4 40 14 2						
M.	13	1 48	1 30 11 5	1 46 11 4	8 5 20 6	8 21 20 5	4 55 14 2	5 11 14 2						
Tu.	14	2 30	2 2 11 3	2 18 11 2	8 36 20 4	8 51 20 2	5 26 13 11	5 41 13 9						
W.	15	3 12	2 33 11 1	2 48 11 0	9 5 19 10	9 21 19 6	5 56 13 6	6 12 13 3						
Th.	16	3 55	3 3 10 10	3 19 10 8	9 38 19 2	9 54 18 9	6 29 13 0	6 47 12 2						
F.	17	4 40	3 36 10 6	3 52 10 4	10 10 18 4	10 29 17 11	7 5 12 5	7 25 12 2						
S.	18	5 27	4 9 10 2	4 28 10 0	10 49 17 5	11 15 16 11	7 46 11 9	8 9 11 5						
	19	6 17	4 50 9 10	5 14 9 8	11 44 16 6	— — — —	8 34 11 1	9 6 10 10						
M.	20	7 9	5 44 9 6	6 18 9 5	0 19 16 1	0 56 15 9	9 43 10 8	10 23 10 7						
Tu.	21	8 3	7 0 9 5	7 45 9 7	1 33 15 9	2 12 15 10	11 4 10 8	11 45 10 12						
W.	22	8 59	8 28 9 9	9 8 10 0	2 51 16 3	3 30 17 0	— — — —	0 22 11 4						
Th.	23	9 55	9 44 10 4	10 15 10 8	4 6 17 9	4 36 18 7	0 56 11 11	1 26 12 2						
F.	24	10 52	10 44 11 0	11 10 11 4	5 3 19 5	5 27 20 2	1 54 13 1	2 22 13 7						
S.	25	11 48	11 33 11 8	11 55 12 0	5 49 20 10	6 11 21 6	2 45 14 2	3 7 14 2						
	26	0 44	— — — —	0 17 12 2	6 34 22 0	6 57 22 5	3 28 15 1	3 49 15 5						
M.	27	1 40	0 39 12 4	1 1 12 5	7 20 22 9	7 42 22 11	4 11 15 9	4 32 15 11						
Tu.	28	2 35	1 23 12 5	1 46 12 4	8 5 22 11	8 27 22 10	4 54 15 11	5 16 15 9						
Half Mean Spring Range.			5 ft. 9 in.				10 ft. 5 in.				7 ft. 2 in.			
Phases of the Moon.						Moon's Declination at Noon.								
		D. H. M.				M.D.	° ' "	M.D.	° ' "	M.D.	° ' "	M.D.	° ' "	
First Quarter	3	1 9	Morning.			1	9 N. 45	9	13 N. 33	17	14 S. 51	25	6 S. 56	
Full	10	4 27	Afternoon.			2	13 32	10	10 20	18	17 9	26	1 43	
Last Quarter	18	9 38	Afternoon.			3	16 28	11	6 43	19	18 41	27	3 S. 17	
New	25	8 3	Afternoon.			4	18 26	12	2 52	20	19 18	28	8 1	
						5	19 22	13	1 S. 3	21	18 53			
In Apogee	13	9 0	Afternoon.			6	19 16	14	4 55	22	17 21			
In Perigee	26	0 0	Noon.			7	18 11	15	8 36	23	14 41			
						8	16 14	16	11 57	24	11 2			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

FEBRUARY, 1865.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	
	1	6 50 13 3		7 13 12 11		5 44 16 4		6 9 15 11		— —		0 1 12 8		5.1
	2	7 38 12 5		8 5 11 10		6 35 15 4		7 1 14 8		0 26 12 2		0 52 11 7		6.1
	3	8 33 11 3		9 5 10 10		7 28 14 2		8 0 13 8		1 19 11 1		1 50 10 7		7.1
	4	9 41 10 5		10 22 10 2		8 35 13 2		9 15 12 11		2 26 10 2		3 7 9 10		8.1
	5	11 3 10 1		11 45 10 2		9 57 12 9		10 38 12 9		3 53 9 8		4 38 9 6		9.1
	6	— —		0 24 10 3		11 17 12 10		11 51 13 1		5 18 9 6		5 52 9 9		10.1
	7	0 58 10 6		1 28 10 9		— —		0 22 13 4		6 24 10 1		6 50 10 6		11.1
	8	1 55 11 0		2 19 11 4		0 49 13 9		1 13 14 2		7 12 11 0		7 32 11 5		12.1
	9	2 41 11 8		3 0 12 0		1 36 14 7		1 56 15 0		7 49 11 10		8 4 12 3		13.1
	10	3 17 12 3		3 35 12 6		2 15 15 4		2 33 15 7		8 21 12 7		8 38 12 10		14.1
	11	3 52 12 9		4 8 12 10		2 51 15 10		3 6 15 11		8 54 12 11		9 9 12 11		15.1
	12	4 24 12 11		4 41 12 11		3 21 16 0		3 36 16 0		9 25 12 11		9 41 12 10		16.1
	13	4 57 12 10		5 14 12 9		3 52 15 11		4 8 15 9		9 58 12 9		10 14 12 8		17.1
	14	5 30 12 8		5 44 12 6		4 24 15 8		4 39 15 6		10 29 12 6		10 45 12 3		18.1
	15	6 0 12 3		6 16 12 1		4 55 15 3		5 10 15 1		11 1 12 0		11 18 11 8		19.1
	16	6 33 11 11		6 50 11 8		5 27 14 10		5 45 14 6		11 36 11 4		11 55 11 0		20.1
	17	7 7 11 5		7 26 11 1		6 3 14 3		6 23 13 10		— —		0 14 10 8		21.1
	18	7 48 10 8		8 13 10 3		6 44 13 5		7 8 13 0		0 36 10 3		1 0 9 11		22.1
	19	8 41 9 10		9 15 9 8		7 36 12 8		8 9 12 4		1 26 9 7		2 0 9 3		23.1
	20	9 55 9 6		10 35 9 6		8 47 12 2		9 29 12 1		2 39 9 1		3 22 9 0		24.1
	21	11 16 9 8		11 58 9 11		10 11 12 3		10 51 12 6		4 9 9 1		4 51 9 3		25.1
	22	— —		0 36 10 4		11 29 12 11		— —		5 31 9 7		6 5 10 1		26.1
	23	1 9 10 9		1 37 11 3		0 3 13 5		0 31 14 0		6 33 10 9		6 56 11 6		27.1
	24	2 2 11 10		2 26 12 5		0 56 14 8		1 21 15 5		7 18 12 3		7 37 13 0		28.1
	25	2 48 13 0		3 8 13 6		1 44 16 1		2 5 16 8		7 55 13 8		8 14 14 2		29.1
	26	3 28 14 0		3 50 14 4		2 26 17 2		2 48 17 7		8 35 14 7		8 57 14 9		30.7
	27	4 12 14 7		4 33 14 8		3 9 17 11		3 29 17 11		9 18 14 10		9 41 14 10		31.7
	28	4 56 14 7		5 19 14 5		3 52 17 10		4 14 17 8		10 4 14 8		10 27 14 4		32.7
Half Mean Spring Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
1	13 56	Sub.	9	14 31	Sub.	17	14 15	Sub.	25	13 16	Sub.
2	14 3		10	14 31		18	14 10		26	13 6	
3	14 9		11	14 31		19	14 4		27	12 55	
4	14 15		12	14 30		20	14 38		28	12 44	
5	14 20		13	14 29		21	13 51				
6	14 24		14	14 26		22	13 43				
7	14 27		15	14 23		23	13 35				
8	14 29		16	14 20		24	13 26				

the times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 11 m.

FEBRUARY, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTER			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.				
W.	1	4 46	3 14	10 0	3 36	9 9	2 25	26 3	2 47	25 6	9 38	20 9	9 59													
Th.	2	5 39	3 58	9 7	4 21	9 4	3 9	24 8	3 32	23 9	10 20	19 1	10 42													
F.	3	6 33	4 45	9 2	5 12	8 11	3 56	22 10	4 26	22 0	11 5	17 6	11 30													
S.	4	7 27	5 42	8 8	6 18	8 5	4 59	21 1	5 39	20 7	—	—	0 3													
S.	5	8 20	6 57	8 3	7 41	8 3	6 23	20 4	7 11	20 4	0 39	15 9	1 24													
M.	6	9 12	8 22	8 3	9 0	8 5	7 51	20 7	8 29	21 1	2 11	15 9	2 52													
Tu.	7	10 3	9 34	8 7	10 5	8 8	9 0	21 7	9 28	22 3	3 29	16 8	4 1													
W.	8	10 51	10 33	8 10	10 56	9 0	9 53	22 10	10 15	23 5	4 32	17 11	4 58													
Th.	9	11 38	11 18	9 1	11 39	9 2	10 34	23 10	10 58	24 3	5 21	18 11	5 43													
F.	10	morn.	11 59	9 3	—	—	11 12	24 7	11 31	25 0	6 4	19 9	6 23													
S.	11	0 22	0 19	9 5	0 36	9 6	11 48	25 3	—	—	6 39	20 4	6 55													
S.	12	1 6	0 52	9 7	1 9	9 7	0 4	25 5	0 21	25 6	7 11	20 7	7 37													
M.	13	1 48	1 26	9 7	1 43	9 7	0 37	25 6	0 53	25 5	7 43	20 6	7 58													
Tu.	14	2 30	1 58	9 7	2 12	9 7	1 9	25 4	1 24	25 1	8 13	20 2	8 28													
W.	15	3 12	2 27	9 6	2 42	9 5	1 38	24 8	1 51	24 3	8 44	19 7	9 0													
Th.	16	3 55	2 58	9 3	3 13	9 2	2 7	23 10	2 24	23 4	9 16	18 9	9 31													
F.	17	4 40	3 29	9 1	3 46	8 11	2 40	22 10	2 56	22 3	9 47	17 9	10 4													
S.	18	5 27	4 5	8 9	4 26	8 8	3 15	21 8	3 37	21 0	10 23	16 8	10 44													
S.	19	6 17	4 49	8 6	5 19	8 4	4 2	20 4	4 34	19 9	11 9	15 6	11 39													
M.	20	7 9	5 52	8 2	6 30	8 1	5 11	19 4	5 53	19 3	—	—	0 13													
Tu.	21	8 3	7 11	8 0	7 54	8 1	6 40	19 6	7 24	20 0	0 52	14 11	1 39													
W.	22	8 59	8 36	8 4	9 13	8 7	8 5	20 9	8 41	21 8	2 25	15 10	3 6													
Th.	23	9 55	9 45	8 10	10 13	9 1	9 10	22 8	9 36	23 9	3 40	17 8	4 11													
F.	24	10 52	10 41	9 4	11 5	9 7	10 0	24 9	10 22	25 9	4 41	19 8	5 8													
S.	25	11 48	11 29	9 10	11 53	10 0	10 43	26 7	11 6	27 3	5 33	21 5	5 57													
S.	26	0 44	—	—	0 17	10 2	11 29	27 11	11 51	28 5	6 20	22 8	6 43													
M.	27	1 40	0 40	10 4	1 2	10 5	—	—	0 13	28 7	7 4	23 4	7 27													
Tu.	28	2 35	1 26	10 6	1 48	10 5	0 36	28 8	0 59	28 6	7 49	23 3	8 11													
Half Mean Spring Range.			4 ⁿ . 10 ⁱⁿ .								13 ⁿ . 0 ⁱⁿ .								10 ⁿ . 6 ⁱⁿ .							
Phases of the Moon.												Moon's Declination at Noon.														
D. H. M.												M.D. ° ' "														
First Quarter - 3 1 9 Morning.												1 9 N. 45 9 13 N. 33 17 14 8.51 25 6														
Full - - - - - 10 4 27 Afternoon.												2 13 32 10 10 20 18 17 9 25 1														
Last Quarter - 18 9 38 Afternoon.												3 16 28 11 6 43 19 18 41 27 5														
New - - - - - 25 8 3 Afternoon.												4 18 26 12 2 52 20 19 18 28 8														
In Apogee - - 13 9 0 Afternoon.												5 19 22 13 18. 3 21 18 53														
In Perigee - - 26 0 0 Noon.												6 19 16 14 4 55 22 17 21														
												7 18 11 15 8 36 23 14 41														
												8 16 14 16 11 57 24 11 2														

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

FEBRUARY, 1865.

WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
Time. H. M. F. L.	Height.			Time. H. M. F. L.	Height.			Time. H. M. F. L.	Height.			Time. H. M. F. L.	Height.			Time. H. M. F. L.	Height.			Time. H. M. F. L.	Height.			
10 12 37 2				10 31 35 11				1 19 16 2				1 43 15 8				2 19 10 10				2 43 10 7				5.1
10 49 34 6				11 9 33 2				2 8 15 2				2 33 14 8				3 7 10 4				3 32 10 0				6.1
11 33 31 10				— —				3 0 14 1				3 31 13 8				3 58 9 9				4 30 9 6				7.1
0 2 30 6				0 38 29 7				4 7 13 2				4 48 12 11				5 5 9 2				5 42 9 0				8.1
1 16 29 0				2 2 28 10				5 30 12 10				6 12 12 10				6 20 8 11				6 59 9 0				9.1
2 44 29 0				3 25 29 6				6 51 12 11				7 25 13 2				7 38 9 1				8 13 9 3				10.1
4 3 30 2				4 39 31 1				7 56 13 5				8 24 13 9				8 46 9 5				9 17 9 7				11.1
5 12 32 1				5 39 33 0				8 49 14 1				9 10 14 5				9 46 9 10				10 10 10 0				12.1
6 2 33 10				6 24 34 7				9 29 14 9				9 47 15 0				10 29 10 2				10 46 10 4				13.1
6 45 35 2				7 5 35 7				10 6 15 3				10 24 15 5				11 3 10 6				11 20 10 8				14.1
7 22 36 0				7 39 36 5				10 39 15 7				10 53 15 8				11 36 10 9				11 52 10 9				15.1
7 55 36 6				8 10 36 7				11 8 15 8				11 22 15 8				— —				0 9 10 9				16.1
8 26 36 6				8 41 36 5				11 38 15 7				11 54 15 6				0 25 10 9				0 42 10 8				17.1
8 55 36 1				9 9 35 9				— —				0 10 15 4				0 58 10 7				1 13 10 6				18.1
9 22 35 4				9 37 34 9				0 26 15 2				0 42 14 11				1 29 10 4				1 45 10 3				19.1
9 51 34 0				10 5 33 4				1 0 14 8				1 19 14 4				2 2 10 1				2 19 9 11				20.1
10 19 32 5				10 34 31 6				1 37 14 0				1 56 13 8				2 37 9 9				2 56 9 6				21.1
10 51 30 6				11 11 29 6				2 17 13 4				2 41 13 0				3 16 9 4				3 39 9 2				22.1
11 39 28 8				— —				3 7 12 7				3 41 12 4				4 6 8 11				4 39 8 9				23.1
0 12 27 11				0 49 27 7				4 20 12 2				5 2 12 1				5 16 8 7				5 53 8 7				24.1
1 31 27 8				2 15 28 2				5 44 12 3				6 25 12 7				6 33 8 8				7 12 8 10				25.1
2 58 29 1				3 39 30 4				7 3 13 0				7 37 13 6				7 50 9 2				8 26 9 5				26.1
4 17 31 9				4 50 33 4				8 6 14 0				8 32 14 8				8 57 9 9				9 26 10 1				27.1
5 22 34 11				5 49 36 6				8 56 15 3				9 17 15 10				9 54 10 5				10 17 10 9				28.1
6 14 37 10				6 39 39 0				9 38 16 5				9 59 16 10				10 36 11 1				10 56 11 4				29.1
7 3 39 10				7 26 40 8				10 21 17 2				10 42 17 6				11 18 11 8				11 40 11 9				0.7
7 48 41 1				8 10 41 1				11 1 17 7				11 22 17 7				— —				0 1 11 10				1.7
8 32 41 0				8 53 40 6				11 44 17 6				— —				0 24 11 9				0 48 11 8				2.7
Mean Spring Range. } 18ft. 7in.								8ft. 0in.								5ft. 6in.								

Equation of Time at Noon.

M. S.		M.D.	M. S.		M.D.	M. S.		M.D.	M. S.	
13 56	Sub.	9	14 31	Sub.	17	14 15	Sub.	25	13 16	Sub.
14 3		10	14 31		18	14 10		26	13 6	
14 9		11	14 31		19	14 4		27	12 55	
14 15		12	14 30		20	13 58		28	12 44	
14 20		13	14 29		21	13 51				
14 24		14	14 26		22	13 43				
14 27		15	14 23		23	13 35				
14 29		16	14 20		24	13 26				

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

FEBRUARY, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.																								
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																				
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																							
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.																							
W.	1	4 46	1 58	9 6	2 23	9 4	11 22	7 3	11 51	6 11	8 44	10 6	9 9																														
Th.	2	5 39	2 50	9 2	3 16	8 11	—	—	0 22	6 7	9 36	9 9	10 7																														
F.	3	6 33	3 43	8 9	4 13	8 6	0 57	6 3	1 35	6 0	10 40	9 0	11 16																														
S.	4	7 27	4 46	8 4	5 23	8 2	2 17	5 10	3 0	5 10	11 55	8 7	—																														
S.	5	8 20	6 1	8 1	6 43	8 0	3 39	5 11	4 17	6 0	0 34	8 6	1 17																														
M.	6	9 12	7 23	8 1	7 59	8 2	4 50	6 2	5 19	6 3	1 56	8 6	2 32																														
Tu.	7	10 3	8 30	8 3	8 58	8 6	5 44	6 5	6 9	6 7	3 2	9 0	3 29																														
W.	8	10 51	9 23	8 8	9 45	8 10	6 33	6 9	6 56	6 11	3 52	9 7	4 12																														
Th.	9	11 38	10 5	9 0	10 24	9 1	7 17	7 0	7 37	7 2	4 31	10 2	4 50																														
F.	10	morn.	10 42	9 2	11 0	9 3	7 56	7 3	8 14	7 5	5 9	10 8	5 28																														
S.	11	0 22	11 16	9 4	11 31	9 4	8 29	7 6	8 44	7 7	5 45	10 11	6 1																														
S.	12	1 6	11 46	9 4	—	—	8 58	7 7	9 13	7 6	6 16	11 0	6 31																														
M.	13	1 48	0 1	9 3	0 17	9 3	9 28	7 5	9 42	7 4	6 47	10 10	7 3																														
Tu.	14	2 30	0 34	9 3	0 50	9 3	9 56	7 2	10 10	7 0	7 18	10 7	7 33																														
W.	15	3 12	1 5	9 2	1 21	9 1	10 25	6 11	10 41	6 9	7 48	10 1	8 4																														
Th.	16	3 55	1 39	9 0	1 58	8 10	10 57	6 7	11 16	6 5	8 20	9 7	8 38																														
F.	17	4 40	2 18	8 9	2 38	8 7	11 39	6 2	—	—	8 57	9 1	9 20																														
S.	18	5 27	2 59	8 5	3 23	8 3	0 5	5 11	0 35	5 8	9 46	8 6	10 15																														
S.	19	6 17	3 49	8 2	4 21	8 1	1 8	5 5	1 48	5 4	10 50	8 1	11 29																														
M.	20	7 9	4 57	8 0	5 35	7 11	2 32	5 4	3 12	5 5	—	—	0 8																														
Tu.	21	8 3	6 14	7 11	6 56	7 11	3 52	5 8	4 28	5 11	0 48	8 1	1 30																														
W.	22	8 59	7 36	8 1	8 11	8 3	5 0	6 2	5 28	6 5	2 9	8 7	2 44																														
Th.	23	9 55	8 40	8 6	9 6	8 10	5 52	6 9	6 16	7 0	3 11	9 5	3 36																														
F.	24	10 52	9 31	9 2	9 53	9 5	6 40	7 4	7 4	7 8	3 58	10 6	4 19																														
S.	25	11 48	10 14	9 7	10 35	9 9	7 27	7 11	7 49	8 2	4 40	11 5	5 31																														
S.	26	0 44	10 57	9 11	11 18	10 0	8 11	8 5	8 32	8 6	5 26	12 1	5 48																														
M.	27	1 40	11 38	10 0	12 0	10 0	8 52	8 7	9 12	8 6	6 8	12 5	6 30																														
Tu.	28	2 35	—	—	0 23	10 8	9 33	8 5	9 54	8 3	6 53	12 3	7 16																														
Half Mean Spring } Range.			4 ft. 9 in.								3 ft. 10 in.								5 ft. 7 in.																								
Phases of the Moon.																						Moon's Declination at Noon.																					
D. H. M.																						M.D. ° ' M.D. ° ' M.D. ° ' M.D. ° '																					
First Quarter 3 1 9 Morning.																						1 9 N. 45 9 13 N. 33 17 14 8. 51 25 6																					
Full - - - - 10 4 27 Afternoon.																						2 13 32 10 10 20 18 17 9 26 1																					
Last Quarter - 18 9 38 Afternoon.																						3 16 28 11 6 43 19 18 41 27 3																					
New - - - - 25 8 3 Afternoon.																						4 18 26 12 2 52 20 19 18 28 8																					
In Apogee - - 13 9 0 Afternoon.																						5 19 22 13 1 53 21 18 53																					
In Perigee - - 26 0 0 Noon.																						6 19 16 14 4 55 22 17 21																					
																						7 18 11 15 8 36 23 14 41																					
																						8 16 14 16 11 57 24 11 2																					

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required
 BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 2 m.

FEBRUARY, 1865.

GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.							
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.											
Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.				D.						
8 8 14 6				8 32 13 11				8 29 11 7				8 49 11 2				8 47 12 7				9 7 12 2				5.1							
8 57 13 2				9 23 12 6				9 11 10 9				9 34 10 5				9 27 11 9				9 48 11 5				6.1							
9 52 12 0				10 25 11 6				9 58 10 0				10 26 9 8				10 15 11 0				10 48 10 6				7.1							
11 4 11 2				11 45 11 0				11 3 9 4				11 42 9 3				11 24 10 2				—				8.1							
—				0 29 11 0				—				0 26 9 2				0 1 10 0				0 40 9 11				9.1							
1 8 11 2				1 43 11 5				1 6 9 3				1 48 9 5				1 19 10 0				1 58 10 1				10.1							
2 13 11 9				2 41 12 1				2 25 9 7				2 57 9 10				2 36 10 4				3 9 10 8				11.1							
3 8 12 6				3 32 12 10				3 26 10 2				3 50 10 5				3 41 10 11				4 8 11 2				12.1							
3 51 13 2				4 10 13 6				4 12 10 8				4 32 10 11				4 31 11 5				4 54 11 8				13.1							
4 29 13 10				4 47 14 1				4 52 11 1				5 11 11 3				5 15 11 10				5 34 11 11				14.1							
5 2 14 3				5 18 14 5				5 28 11 5				5 45 11 6				5 50 12 0				6 6 12 2				15.1							
5 35 14 6				5 51 14 6				6 2 11 6				6 18 11 6				6 23 12 2				6 38 12 2				16.1							
6 8 14 5				6 24 14 4				6 35 11 6				6 50 11 6				6 55 12 2				7 12 12 2				17.1							
6 39 14 2				6 54 13 11				7 5 11 4				7 20 11 2				7 27 12 1				7 41 12 0				18.1							
7 10 13 8				7 27 13 4				7 35 11 0				7 51 10 10				7 55 11 11				8 10 11 9				19.1							
7 44 13 1				8 2 12 9				8 7 10 7				8 22 10 5				8 25 11 7				8 40 11 4				20.1							
8 21 12 3				8 41 11 10				8 37 10 2				8 55 9 10				8 55 11 1				9 11 10 10				21.1							
9 4 11 4				9 28 10 11				9 15 9 6				9 37 9 3				9 29 10 7				9 52 10 3				22.1							
10 0 10 7				10 37 10 4				10 3 9 0				10 36 8 10				10 23 10 0				10 58 9 8				23.1							
11 17 10 4				12 0 10 6				11 15 8 9				11 57 8 10				11 35 9 7				—				24.1							
—				0 42 10 9				—				0 40 9 0				0 14 9 6				0 53 9 9				25.1							
1 21 11 3				1 55 11 9				1 22 9 3				2 3 9 8				1 32 10 0				2 11 10 5				26.1							
2 23 12 5				2 50 13 1				2 36 10 1				3 6 10 7				2 47 10 11				3 20 11 4				27.1							
3 17 13 9				3 39 14 5				3 35 11 0				3 59 11 6				3 51 11 9				4 18 12 3				28.1							
4 0 15 0				4 22 15 7				4 22 11 11				4 45 12 3				4 44 12 8				5 8 13 0				29.1							
4 44 16 1				5 6 16 5				5 9 12 7				5 32 12 10				5 32 13 3				5 53 13 5				0.7							
5 28 16 7				5 51 16 7				5 55 12 11				6 18 12 11				6 15 13 7				6 38 13 7				1.7							
6 14 16 6				6 37 16 2				6 40 12 11				7 3 12 9				7 1 13 7				7 24 13 6				2.7							
If Mean Spring } Range. }								7ft. 5in.								5ft. 10in.								6ft. 2in.							

Equation of Time at Noon.

M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
13 56		9	14 31		17	14 15		25	13 16	
14 3		10	14 31		18	14 10		26	13 6	
14 9		11	14 31		19	14 4		27	12 55	
14 15		12	14 30		20	13 58		28	12 44	
14 20		13	14 29		21	13 51				
14 24		14	14 26		22	13 43				
14 27		15	14 23		23	13 35				
14 29		16	14 20		24	13 26				

is of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

MARCH, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	3 31	6 5	20 6	6 27	19 11	8 5	16 5	8 27	15 10	1 45	13 7	2 7	1
Th.	2	4 26	6 49	19 1	7 11	18 2	8 47	15 7	9 6	15 2	2 28	13 1	2 50	1
F.	3	5 22	7 36	17 2	8 1	16 2	9 27	14 8	9 50	14 2	3 19	12 4	3 36	1
S.	4	6 16	8 27	15 3	8 56	14 5	10 13	13 7	10 38	13 3	4 0	11 5	4 24	1
♄	5	7 9	9 31	13 10	10 11	13 5	11 7	12 6	11 38	12 6	4 52	10 6	5 25	1
M.	6	8 0	10 59	13 3	11 43	13 4	—	—	0 17	11 11	6 4	9 10	6 48	1
Tu.	7	8 49	—	—	0 26	13 8	0 59	12 4	1 41	12 0	7 31	9 10	8 13	1
W.	8	9 36	1 3	14 2	1 35	14 9	2 20	12 10	2 56	12 7	8 53	10 5	9 24	1
Th.	9	10 20	1 57	15 5	2 19	16 1	3 29	13 7	3 56	13 3	9 49	11 0	10 13	1
F.	10	11 4	2 39	16 8	2 56	17 3	4 21	14 3	4 44	13 11	10 34	11 7	10 52	1
S.	11	11 46	3 13	17 9	3 30	18 2	5 4	14 9	5 23	14 5	11 9	12 0	11 26	1
♄	12	morn.	3 47	18 5	4 2	18 6	5 41	15 2	5 58	14 10	11 43	12 4	11 58	1
M.	13	0 28	4 17	18 8	4 32	18 9	6 14	15 3	6 30	15 0	—	—	0 13	1
Tu.	14	1 10	4 48	18 8	5 2	18 8	6 46	15 3	7 0	15 0	0 29	12 5	0 45	1
W.	15	1 53	5 17	18 6	5 31	18 3	7 12	14 11	7 26	14 8	1 1	12 5	1 17	1
Th.	16	2 38	5 47	18 0	6 3	17 9	7 40	14 6	7 54	14 3	1 32	12 3	1 48	1
F.	17	3 24	6 19	17 4	6 36	16 10	8 10	14 0	8 26	13 10	2 3	12 0	2 20	1
S.	18	4 12	6 54	16 3	7 15	15 8	8 41	13 5	8 58	13 4	2 37	11 7	2 55	1
♄	19	5 1	7 38	15 0	8 1	14 6	9 18	12 10	9 39	12 10	3 15	11 1	3 36	1
M.	20	5 53	8 25	13 11	8 57	13 6	10 2	12 2	10 30	12 5	3 58	10 7	4 22	1
Tu.	21	6 47	9 35	13 6	10 20	13 5	11 3	11 9	11 41	12 3	4 54	10 0	5 30	1
W.	22	7 41	11 8	13 8	11 52	14 3	—	—	0 26	11 10	6 12	9 10	6 57	1
Th.	23	8 36	—	—	0 30	15 0	1 11	12 0	1 55	12 7	7 39	10 3	8 19	1
F.	24	9 31	1 3	15 10	1 34	16 11	2 35	13 8	3 10	13 7	8 54	11 3	9 27	1
S.	25	10 26	1 59	17 11	2 22	18 11	3 42	14 9	4 10	14 8	9 53	12 3	10 17	1
♄	26	11 21	2 43	19 9	3 5	20 7	4 37	15 9	5 2	15 8	10 39	13 1	11 1	1
M.	27	0 18	3 28	21 0	3 51	21 4	5 26	16 6	5 50	16 4	11 24	13 7	11 46	1
Tu.	28	1 14	4 14	21 6	4 37	21 5	6 14	16 11	6 37	16 8	—	—	0 10	1
W.	29	2 12	4 59	21 3	5 21	20 11	7 1	16 9	7 21	16 5	0 35	13 9	0 59	1
Th.	30	3 9	5 43	20 4	6 6	19 9	7 42	16 3	8 3	16 0	1 21	13 6	1 44	1
F.	31	4 6	6 27	19 0	6 49	18 1	8 24	15 6	8 44	15 3	2 6	13 0	2 28	1

Half Mean Spring }
Range.

9ft. 6in.

7ft. 9in.

6ft. 4in.

Phases of the Moon.

	D.	H.	M.	
First Quarter -	4	0	19	Afternoon.
Full - - - - -	12	10	42	Morning.
Last Quarter -	20	0	36	Afternoon.
New - - - - -	27	5	28	Morning.
In Apogee - -	13	2	0	Morning.
In Perigee - -	26	12	0	Midnight.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	12	N. 10	9	11	N. 6	17	16	S. 25	25	4	
2	15	28	10	7	39	18	18	8	26	0	
3	17	47	11	3	54	19	19	1	27	5	
4	19	0	12	0	2	20	18	57	28	10	
5	19	10	13	38	50	21	17	52	29	14	
6	18	19	14	7	33	22	15	43	30	16	
7	16	36	15	10	58	23	12	36	31	18	
8	14	8	16	13	59	24	8	36			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required

Brest add 18 m.

Devonport add 17 m.

Portsmouth add 4 m.

MARCH, 1865.

DOVER.						SHEERNESS.						LONDON.						C's AGE AT NOON.
MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			
Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.		
21	20	4	1 45	20	0	2 53	17	4	3 14	17	2	4 23	20	7	4 45	20	5	3.7
8	19	7	2 31	19	0	3 35	16	10	3 57	16	5	5 6	20	2	5 27	19	9	4.7
54	18	3	3 17	17	6	4 19	16	0	4 42	15	5	5 48	19	3	6 12	18	9	5.7
41	16	9	4 5	16	0	5 6	14	11	5 32	14	5	6 35	18	2	7 1	17	6	D
31	15	3	5 1	14	7	6 0	13	11	6 32	13	5	7 28	17	0	8 0	16	6	7.7
36	14	2	6 16	14	0	7 10	13	0	7 53	12	10	8 37	16	0	9 21	15	9	8.7
57	14	1	7 39	14	5	8 40	12	10	9 22	13	1	10 4	15	6	10 47	15	7	9.7
18	14	11	8 48	15	5	10 3	13	4	10 39	13	8	11 30	15	9	—	—	—	10.7
12	15	11	9 36	16	4	11 7	14	0	11 31	14	4	0 6	16	0	0 34	16	4	11.7
57	16	10	10 16	17	2	11 52	14	8	—	—	—	1 0	16	9	1 23	17	2	12.7
35	17	6	10 54	17	10	0 11	14	11	0 29	15	2	1 42	17	6	2 0	17	10	13.7
12	18	1	11 30	18	2	0 46	15	5	1 3	15	7	2 18	18	1	2 34	18	5	0
46	18	4	—	—	—	1 19	15	9	1 34	15	10	2 50	18	7	3 5	18	9	15.7
2	18	5	0 19	18	4	1 49	15	11	2 4	15	11	3 19	18	11	3 33	19	0	16.7
36	18	4	0 52	18	3	2 19	15	11	2 34	15	10	3 49	19	0	4 3	18	11	17.7
9	18	2	1 26	17	11	2 48	15	9	3 2	15	7	4 19	18	10	4 35	18	9	18.7
43	17	9	2 0	17	6	3 17	15	5	3 32	15	3	4 50	18	7	5 5	18	4	19.7
18	17	2	2 37	16	9	3 49	15	0	4 7	14	9	5 20	18	2	5 37	17	10	20.7
56	16	3	3 17	15	10	4 25	14	5	4 45	14	0	5 56	17	6	6 16	17	22	1.7
39	15	4	4 3	14	11	5 8	13	8	5 32	13	5	6 39	16	9	7 2	16	5	C
32	14	6	5 5	14	2	6 0	13	1	6 36	12	10	7 30	16	2	8 3	15	11	23.7
43	14	2	6 24	14	4	7 16	12	9	8 2	12	11	8 45	15	9	9 29	15	8	24.7
5	14	10	7 45	15	6	8 49	13	2	9 30	13	7	10 13	15	10	10 56	16	22	25.7
19	16	3	8 50	17	1	10 7	14	1	10 39	14	7	11 34	16	6	—	—	—	26.7
16	17	10	9 41	18	7	11 8	15	2	11 32	15	8	0 6	17	1	0 35	17	8	27.7
5	19	3	10 29	19	10	11 54	16	2	—	—	—	1 0	18	3	1 25	18	10	28.7
53	20	2	11 18	20	6	0 16	16	7	0 38	17	0	1 47	19	5	2 9	19	11	29.7
43	20	7	—	—	—	1 1	17	3	1 23	17	5	2 31	20	3	2 54	20	6	1.3
9	20	7	0 33	20	6	1 46	17	6	2 9	17	5	3 16	20	8	3 37	20	8	2.3
56	20	3	1 21	19	10	2 31	17	3	2 52	17	1	3 59	20	7	4 22	20	4	3.3
45	19	4	2 8	18	10	3 13	16	9	3 35	16	4	4 45	20	0	5 7	19	7	4.3
Mean Spring Tide.			9ft. 4in.			8ft. 0in.			9ft. 7in.									

Equation of Time at Noon.

L. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
32		9	10 41		17	8 27		25	6 2	
20		10	10 26		18	8 10		26	5 44	
7		11	10 10		19	7 52		27	5 26	
54		12	9 53		20	7 34		28	5 7	
41		13	9 37		21	7 16		29	4 49	
26		14	9 20		22	6 57		30	4 30	
13		15	9 2		23	6 39		31	4 12	
57		16	8 45		24	6 21				

High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
Dover subtract 5 m. SHEERNESS subtract 3 m. LONDON 0 m.

TIDE TABLES FOR THE

MARCH, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
		H. M.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.								
W.	1	3 31	2 9 12 3	2 31 12 1	8 49 22 7	9 11 22 1	5 39 15 6	6 11 15 3																		
Th.	2	4 24	2 53 11 11	3 10 11 8	9 33 21 5	9 55 20 9	6 24 14 8	6 47 14 7																		
F.	3	5 22	3 37 11 5	3 59 11 1	10 17 20 0	10 42 19 2	7 12 13 7	7 38 13 1																		
S.	4	6 16	4 22 10 9	4 46 10 5	11 10 18 4	11 42 17 7	8 4 12 5	8 32 11 3																		
S.	5	7 9	5 13 10 2	5 42 9 11	—	—	9 4 11 5	9 41 11 1																		
M.	6	8 0	6 17 9 8	7 0 9 7	0 55 16 4	1 33 16 0	10 23 10 9	11 6 10 3																		
Tu.	7	8 49	7 48 9 7	8 30 9 8	2 14 15 11	2 53 16 1	11 47 10 9	—																		
W.	8	9 36	9 10 9 10	9 46 10 0	3 32 16 7	4 8 17 2	0 24 11 1	0 58 11 3																		
Th.	9	10 20	10 16 10 3	10 41 10 6	4 36 17 8	5 0 18 3	1 26 11 10	1 50 12 1																		
F.	10	11 4	11 3 10 9	11 23 10 11	5 21 18 8	5 40 19 2	2 14 12 7	2 35 12 2																		
S.	11	11 46	11 41 11 1	11 58 11 3	5 57 19 6	6 15 19 9	2 53 13 2	3 10 13 1																		
S.	12	morn.	—	—	0 16 11 4	6 33 20 1	3 26 13 8	3 42 13 0																		
M.	13	0 28	0 33 11 5	0 47 11 5	7 5 20 4	7 20 20 6	4 12 14 0	4 12 14 3																		
Tu.	14	1 10	1 1 11 6	1 17 11 5	7 36 20 7	7 52 20 7	4 42 14 3	4 42 14 1																		
W.	15	1 53	1 33 11 5	1 48 11 4	8 7 20 6	8 21 20 5	5 11 14 1	5 11 14 0																		
Th.	16	2 38	2 3 11 3	2 18 11 2	8 36 20 3	8 52 19 11	5 42 13 10	5 42 13 3																		
F.	17	3 24	2 34 11 0	2 50 10 10	9 8 19 7	9 25 19 3	6 16 13 3	6 16 13 0																		
S.	18	4 12	3 7 10 9	3 24 10 7	9 43 18 9	10 1 18 4	6 55 12 9	6 55 12 2																		
S.	19	5 1	3 42 10 4	4 1 10 2	10 21 17 10	10 44 17 4	7 40 11 1	7 40 11 3																		
M.	20	5 53	4 23 10 0	4 46 9 10	11 12 16 10	11 42 16 5	8 33 11 4	8 33 11 1																		
Tu.	21	6 47	5 11 9 8	5 44 9 6	—	—	9 47 10 8	9 47 10 2																		
W.	22	7 41	6 22 9 6	7 9 9 7	1 1 15 11	1 40 16 0	11 15 11 0	11 15 11 0																		
Th.	23	8 36	7 57 9 9	8 38 10 0	2 22 16 4	3 0 17 0	—	—																		
F.	24	9 31	9 14 10 4	9 46 10 8	3 35 17 10	4 8 18 8	0 58 12 8	0 58 12 2																		
S.	25	10 26	10 18 11 1	1 10 43 11 5	4 38 19 6	5 1 20 4	1 54 13 2	1 54 13 0																		
S.	26	11 21	11 7 11 9	11 29 12 1	5 24 21 1	5 45 21 8	2 41 14 3	2 41 14 0																		
M.	27	0 18	11 52 12 3	—	6 7 22 2	6 31 22 7	3 24 15 2	3 24 15 0																		
Tu.	28	1 14	0 15 12 5	0 36 12 6	6 54 22 10	7 17 23 0	4 9 15 9	4 9 15 12																		
W.	29	2 12	0 58 12 6	1 22 12 5	7 41 22 11	8 4 22 9	4 54 15 11	4 54 15 8																		
Th.	30	3 9	1 45 12 3	2 7 12 1	8 25 22 6	8 48 22 0	5 38 15 6	5 38 15 3																		
F.	31	4 6	2 30 11 10	2 53 11 7	9 11 21 4	9 33 20 8	6 25 14 7	6 25 14 2																		
Half Mean Spring } Range			5 ft. 9 in.				10 ft. 5 in.				7 ft. 2 in.															
Phases of the Moon.										Moon's Declination at Noon.																
D. H. M.										M.D. ° ' "																
First Quarter 4 0 19 Afternoon.										1 12 N. 10 9 11 N. 6 17 16 S. 25 25 48 0																
Full - - - - 12 10 42 Morning.										2 15 28 10 7 39 18 18 8 26 0 3 5																
Last Quarter - 20 0 36 Afternoon.										3 17 47 11 3 54 19 19 1 27 5 5																
New - - - - 27 5 28 Morning.										4 19 0 12 0 2 20 18 57 28 10 12 8																
										5 19 10 13 38.50 21 17 52 29 14 8																
										6 18 19 14 7 33 22 15 43 30 16 33																
In Apogee - - 13 2 0 Morning.										7 16 36 15 10 58 23 12 36 31 18 16																
In Perigee - - 26 12 0 Midnight.										8 14 8 16 13 59 24 8 36																

MARCH, 1865.

NORTH SHIELDS.						LEITH.						THURSO.						C's AGE AT NOON.					
MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.								
no.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.							
. M.	F.	I.	H. M.	F.	I.	H. M.	F.	I.	H. M.	F.	I.	H. M.	F.	I.	H. M.	F.	I.	D.					
42	14	2	6	5	13	11	4	37	17	4	5	0	17	0	10	50	14	0	11 13 13 6 3.7				
28	13	6	6	51	13	1	5	22	16	7	5	45	16	1	11	37	12	11	— — 4.7				
14	12	6	7	40	11	11	6	10	15	6	6	37	14	10	0	2	12	3	0 28 11 8 5.7				
8	11	4	8	39	10	8	7	4	14	2	7	34	13	7	0	55	11	0	1 24 10 6)				
13	10	3	9	53	9	11	8	7	13	0	8	45	12	7	1	58	9	11	2 37 9 6 7.7				
35	9	9	11	18	9	9	9	28	12	3	10	13	12	3	3	22	9	3	4 11 9 1 8.7				
0	9	10	—	—	—	—	10	53	12	4	11	31	12	7	4	53	9	1	5 33 9 3 9.7				
38	10	0	1	11	10	4	—	—	—	—	0	5	12	11	6	7	9	7	6 34 10 0 10.7				
38	10	8	1	59	11	0	0	32	13	4	0	53	13	9	6	54	10	7	7 13 11 1 11.7				
20	11	4	2	39	11	9	1	14	14	3	1	34	14	8	7	30	11	6	7 44 11 11 12.7				
56	12	1	3	11	12	4	1	52	15	0	2	8	15	4	7	58	12	4	8 13 12 8 13.7				
27	12	7	3	43	12	9	2	25	15	8	2	41	15	10	8	29	12	10	8 44 12 11 ○				
58	12	11	4	12	13	0	2	56	16	0	3	9	16	1	8	58	13	0	9 12 13 0 15.7				
27	13	0	4	43	12	11	3	23	16	1	3	38	16	0	9	27	13	0	9 43 12 11 16.7				
59	12	10	5	14	12	8	3	54	15	11	4	9	15	9	9	59	12	9	10 15 12 6 17.7				
30	12	6	5	46	12	4	4	25	15	6	4	41	15	4	10	31	12	3	10 48 12 0 18.7				
5	3	12	6	20	11	11	4	57	15	1	5	14	14	10	11	5	11	8	11 25 11 4 19.7				
5	38	11	6	57	11	4	5	33	14	6	5	53	14	2	11	45	11	0	— — 20.7				
7	18	11	7	43	10	7	6	15	13	9	6	39	13	4	0	7	10	7	0 31 10 2 21.7				
8	10	10	8	39	9	10	7	4	13	0	7	34	12	8	0	56	9	10	1 25 9 6 ⌒				
9	17	9	10	0	9	7	8	11	12	4	8	52	12	3	2	2	9	4	2 44 9 2 23.7				
0	43	9	11	26	10	0	9	37	12	4	10	21	12	7	3	32	9	3	4 20 9 5 24.7				
—	—	—	0	7	10	5	11	0	13	0	11	34	13	6	5	1	9	8	5 36 10 2 25.7				
0	41	10	1	10	11	4	—	—	—	—	0	5	14	1	6	6	10	9	6 33 11 6 26.7				
1	38	12	2	1	12	6	0	32	14	9	0	55	15	5	6	54	12	3	7 14 13 0 27.7				
2	23	13	1	2	42	13	1	18	16	2	1	39	16	9	7	31	13	8	7 50 14 3 28.7				
3	3	14	1	3	25	14	2	1	17	3	2	24	17	8	8	11	14	8	8 33 14 11 ●				
3	47	14	4	10	14	9	2	45	17	11	3	6	18	0	8	55	14	11	9 17 14 10 1.3				
4	33	14	4	56	14	6	3	28	17	11	3	50	17	8	9	40	14	8	10 2 14 4 2.3				
5	18	14	5	42	13	9	4	12	17	4	4	36	17	0	10	26	13	11	10 51 13 5 3.3				
6	6	13	6	28	13	0	5	0	16	6	5	23	16	0	11	15	12	10	11 39 12 2 4.3				
Mean Spring } ange.						6ft. 8in.						8ft. 2in.						6ft. 7in.					

Equation of Time at Noon.

M.	S.	Sub.	M.	S.	M.D.	M.	S.	Sub.	M.	S.	M.D.	M.	S.	Sub.
12	32		9	10	41	Sub.	17	8	27	25	6	2		Sub.
12	20		10	10	26		18	8	10	26	5	44		
12	7		11	10	10		19	7	52	27	5	26		
11	54		12	9	53		20	7	34	28	5	7		
11	41		13	9	37		21	7	16	29	4	49		
11	26		14	9	20		22	6	57	30	4	30		
11	12		15	9	2		23	6	39	31	4	12		
10	57		16	8	45		24	6	21					

of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

MARCH, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.								
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.							
H.	M.	P.	I.	H.	M.	P.	I.	H.	M.	P.	I.	H.	M.	P.	I.	H.	M.	P.	I.	H.	M.	P.	I.	H.	M.	P.	I.
W.	1	3231	2 10 10 4.	2 32 10 3	1 21 28 2	1 43 27 7	8 33 22 5	8 55 1																			
Th.	2	4 26	2 53 10 1	3 15 9 10	2 3 26 9	2 25 25 10	9 17 21 0	9 38 2																			
F.	3	5 22	3 36 9 7	3 59 9 5	2 47 24 11	3 10 23 10	10 0 19 3	10 22 1																			
S.	4	6 16	4 24 9 2	4 49 8 11	3 35 22 10	4 0 21 10	10 45 17 5	11 8 1																			
S.	5	7 9	5 17 8 7	5 51 7 4	4 32 20 10	5 9 20 1	11 37 15 8	—																			
M.	6	8 0	6 30 8 2	7 14 8 0	5 53 19 8	6 43 19 7	0 13 15 2	0 55 1																			
Tu.	7	8 49	7 56 8 1	8 38 8 2	7 26 19 9	8 6 20 3	1 42 15 0	2 28 1																			
W.	8	9 36	9 15 7 4	9 46 7 6	8 43 20 10	9 10 21 6	3 8 16 0	3 41 1																			
Th.	9	10 30	10 10 8 8	10 34 8 10	9 33 22 3	9 54 22 11	4 8 17 4	4 34 1																			
F.	10	11 4	10 54 9 0	11 13 9 1	10 13 23 6	10 30 24 0	4 56 18 7	5 16 1																			
S.	11	11 46	11 32 9 3	11 51 9 4	10 47 24 5	11 4 24 9	5 36 19 6	5 56 1																			
S.	12	morn.	—	0 9 9 5	11 21 25 1	11 37 25 3	6 13 20 2	6 29 2																			
M.	13	0 28	0 25 9 6	0 40 9 7	11 52 25 6	—	6 43 20 7	6 59 2																			
Tu.	14	1 10	0 56 9 7	1 12 9 7	0 8 25 7	0 23 25 7	7 14 20 8	7 29 2																			
W.	15	1 53	1 28 9 7	1 43 9 7	0 39 25 6	0 54 25 5	7 44 20 5	7 58 2																			
Th.	16	2 38	1 57 9 7	2 13 9 6	1 8 25 2	1 24 24 9	8 14 19 11	8 30 1																			
F.	17	3 24	2 29 9 5	2 45 9 4	1 39 24 4	1 55 23 11	8 47 19 3	9 5 1																			
S.	18	4 12	3 2 9 2	3 19 9 0	2 12 23 4	2 30 22 9	9 21 18 3	9 39 1																			
S.	19	5 1	3 38 8 11	4 0 8 9	2 48 22 2	3 10 21 6	9 59 17 2	10 19 1																			
M.	20	5 53	4 22 8 7	4 47 8 5	3 33 20 10	4 0 20 3	10 41 16 0	11 8 1																			
Tu.	21	6 47	5 19 8 4	5 56 8 2	4 35 19 9	5 16 19 7	11 40 15 2	—																			
W.	22	7 41	6 38 8 1	7 23 8 2	6 2 19 8	6 52 20 1	0 20 15 2	1 5 1																			
Th.	23	8 36	8 4 8 4	8 42 8 7	7 34 20 10	8 11 21 9	1 52 15 11	2 34 1																			
F.	24	9 31	9 16 8 11	9 48 9 2	8 42 22 9	9 10 23 11	3 10 17 8	3 44 1																			
S.	25	10 26	10 14 9 5	10 38 9 8	9 34 24 11	9 57 26 0	4 13 19 9	4 40 1																			
S.	26	11 21	11 2 9 11	11 26 10 1	10 18 26 10	10 40 27 6	5 4 21 7	5 30 2																			
M.	27	0 18	11 50 10 3	—	11 3 28 0	11 26 28 6	5 55 22 9	6 18 2																			
Tu.	28	1 14	0 14 10 4	0 38 10 5	11 49 28 8	—	6 40 23 5	7 42 2																			
W.	29	2 12	1 2 10 6	1 25 10 5	0 13 28 8	0 36 28 6	7 26 23 2	7 47 2																			
Th.	30	3 9	1 47 10 4	2 9 10 3	0 58 28 1	1 20 27 5	8 10 22 3	8 35 1																			
F.	31	4 6	2 32 10 1	2 53 9 10	1 42 26 7	2 3 25 9	8 55 20 11	9 17 2																			

Half Mean Spring } 4ft. 10in.
Range.

13ft. 0in.

10ft. 6in.

Phases of the Moon.

	D.	H.	M.	
First Quarter -	4	0	19	Afternoon.
Full - - - - -	12	10	42	Morning.
Last Quarter -	20	0	36	Afternoon.
New - - - - -	27	5	28	Morning.
In Apogee - -	13	2	0	Morning.
In Perigee - -	26	12	0	Midnight.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	12	N. 10	9	11	N. 6	17	16	E. 25	25	4	
2	15	28	10	7	39	18	18	8	26	0	
3	17	47	11	3	54	19	19	1	27	5	
4	19	0	12	0	2	20	18	57	28	10	
5	19	10	13	3	50	21	17	52	29	14	
6	18	19	14	7	33	22	15	43	30	16	
7	16	36	15	10	58	23	12	36	31	18	
8	14	—	16	13	59	24	8	36			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required

GREENOCK add 19 m.

LIVERPOOL add 12 m.

PEMBROKE add 20 m.

MARCH, 1865.

WESTON-SUPER-MARE.										HOLYHEAD.										KINGSTOWN.										C's AGE AT NOON.
MORNING.					AFTERNOON.					MORNING.					AFTERNOON.					MORNING.					AFTERNOON.					
Time.	Height.				Time.	Height.				Time.	Height.				Time.	Height.				Time.	Height.				D.					
I. M. P. I.					H. M. F. I.					H. M. F. I.					H. M. F. I.					H. M. F. I.										
9 14 39 10					9 34 38 11					0 7 17 3					0 31 16 11					1 11 11 6					3.7					
9 53 37 8					10 13 36 3					0 55 16 6					1 19 15 11					1 57 11 1					4.7					
0 32 34 9					10 51 33 3					1 44 15 4					2 10 14 8					2 44 10 5					5.7					
1 12 31 8					11 37 30 2					2 36 14 1					3 5 13 6					3 35 9 9					6					
— — — —					0 11 29 0					3 39 13 0					4 18 12 7					4 37 9 1					7.7					
0 49 28 1					1 34 27 10					5 1 12 4					5 46 12 4					5 53 8 8					8.7					
2 17 27 11					3 0 28 4					6 27 12 6					7 5 12 8					7 14 8 10					9.7					
3 41 29 2					4 17 30 1					7 39 13 0					8 6 13 4					8 28 9 2					10.1					
4 46 31 1					5 13 32 3					8 29 13 9					8 50 14 2					9 23 9 7					11.7					
5 37 33 2					5 57 34 0					9 8 14 6					9 25 14 9					10 8 10 0					12.7					
6 17 34 9					6 37 35 4					9 41 15 1					9 58 15 4					10 40 10 5					13.7					
6 55 35 9					7 11 36 1					10 14 15 6					10 29 15 7					11 11 10 8					14.7					
7 27 36 6					7 42 36 9					10 42 15 9					10 55 15 9					11 40 10 10					15.7					
7 58 36 8					8 13 36 7					11 9 15 9					11 24 15 8					— — — —					16.7					
8 27 36 5					8 41 36 2					11 39 15 7					11 55 15 5					0 27 10 9					17.7					
8 56 35 9					9 10 35 4					— — — —					0 12 15 2					0 59 10 7					18.7					
9 25 34 10					9 40 34 0					0 29 15 0					0 48 14 9					1 32 10 3					19.7					
9 55 33 2					10 11 32 3					1 7 14 4					1 27 14 0					2 7 9 10					20.7					
0 28 31 4					10 46 30 4					1 48 13 8					2 12 13 3					2 48 9 6					21.7					
1 7 29 5					11 40 28 7					2 37 12 11					3 5 12 7					3 35 9 1					22.7					
— — — —					0 16 28 2					3 43 12 4					4 24 12 3					4 41 8 9					23.7					
0 57 28 1					1 43 28 6					5 10 12 4					5 55 12 8					6 1 8 9					24.7					
2 26 29 4					3 6 30 6					6 34 13 1					7 8 13 7					7 21 9 2					25.7					
3 44 31 10					4 21 33 6					7 38 14 1					8 7 14 5					8 28 9 10					26.7					
4 52 35 1					5 21 36 9					8 30 15 5					8 52 16 0					9 27 10 6					27.7					
5 46 38 1					6 11 39 3					9 12 16 6					9 34 17 0					10 12 11 2					28.7					
6 36 40 1					7 0 40 8					9 56 17 4					10 18 17 6					10 53 11 8					29.7					
7 24 41 1					7 47 41 1					10 39 17 8					11 0 17 7					11 37 11 10					30.7					
8 10 40 10					8 31 40 4					11 21 17 5					11 43 17 2					— — — —					31.7					
8 52 39 7					9 13 38 7					— — — —					0 7 16 10					0 47 11 6					32.7					
9 33 37 6					9 52 36 1					0 32 16 4					0 57 15 10					1 35 11 0					33.7					
Mean Spring } 18ft. 7in. Tide.										8ft. 0in.										5ft. 6in.										

Equation of Time at Noon.

M. S.		M. D.	M. S.		M. D.	M. S.		M. D.	M. S.	
2 32	Sub.	9	10 41	Sub.	17	8 27	Sub.	25	6 2	Sub.
2 20		10	10 26		18	8 10		26	5 44	
2 7		11	10 10		19	7 52		27	5 26	
1 54		12	9 53		20	7 34		28	5 7	
1 41		13	9 37		21	7 16		29	4 49	
1 26		14	9 20		22	6 57		30	4 30	
1 12		15	9 2		23	6 39		31	4 12	
0 57		16	8 45		24	6 21				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

TIDE TABLES FOR THE

MARCH, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRAMBIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	3 23	0 47	9 11	1 10	9 10	10 15	8 0	10 36	7 9	7 38	11 8	8 0	
Th.	2	4 26	1 33	9 8	1 58	9 5	10 59	7 5	11 23	7 1	8 22	10 9	8 45	
F.	3	5 22	2 25	9 3	2 52	9 0	11 53	6 8	—	—	9 11	9 9	9 41	
S.	4	6 16	3 19	8 9	3 47	8 6	0 28	6 3	1 5	5 11	10 13	8 11	10 48	
S.	5	7 9	4 19	8 3	4 56	8 1	1 45	5 9	2 30	5 7	11 27	8 4	—	
M.	6	8 0	5 35	8 0	6 16	7 11	3 12	5 7	3 53	5 9	0 8	8 2	0 50	
Tu.	7	8 49	6 58	7 11	7 38	7 11	4 30	5 10	5 2	6 0	1 32	8 2	2 11	
W.	8	9 36	8 13	8 1	8 40	8 3	5 30	6 2	5 54	6 4	2 46	8 8	3 12	
Th.	9	10 20	9 2	8 6	9 24	8 9	6 13	6 6	6 34	6 9	3 33	9 3	3 53	
F.	10	11 4	9 43	8 11	10 1	9 0	6 54	6 11	7 12	7 1	4 10	9 11	4 27	
S.	11	11 46	10 18	9 2	10 34	9 3	7 30	7 3	7 48	7 4	4 44	10 6	5 1	
S.	12	morn.	10 50	9 4	11 5	9 4	8 4	7 5	8 19	7 6	5 18	10 10	5 34	
M.	13	0 28	11 19	9 4	11 33	9 4	8 32	7 7	8 46	7 7	5 49	11 1	6 3	
Tu.	14	1 10	11 48	9 4	—	—	9 0	7 7	9 14	7 6	6 18	11 0	6 38	
W.	15	1 53	0 3	9 4	0 18	9 3	9 28	7 4	9 42	7 3	6 48	10 10	7 3	
Th.	16	2 38	0 34	9 3	0 51	9 2	9 57	7 1	10 12	6 11	7 19	10 5	7 35	
F.	17	3 24	1 8	9 1	1 26	9 0	10 28	6 9	10 46	6 7	7 52	9 11	8 9	
S.	18	4 12	1 46	8 11	2 7	8 9	11 6	6 4	11 31	6 1	8 28	9 4	8 49	
S.	19	5 1	2 30	8 7	2 54	8 5	12 0	5 10	—	—	9 15	8 9	9 43	
M.	20	5 53	3 19	8 3	3 47	8 2	0 32	5 7	1 7	5 5	10 13	8 3	10 52	
Tu.	21	6 47	4 22	8 1	5 0	8 0	1 51	5 5	2 36	5 5	11 32	8 1	—	
W.	22	7 41	5 42	8 0	6 25	8 0	3 20	5 7	4 0	5 11	0 15	8 2	0 59	
Th.	23	8 36	7 6	8 1	7 42	8 3	4 35	6 2	5 3	6 6	1 39	8 7	2 14	
F.	24	9 31	8 13	8 6	8 41	8 10	5 28	6 10	5 52	7 1	2 45	9 6	3 12	
S.	25	10 26	9 4	9 2	9 27	9 5	6 15	7 5	6 38	7 9	3 34	10 6	3 54	
S.	26	11 21	9 49	9 8	10 10	9 10	7 0	8 0	7 23	8 3	4 14	11 6	4 36	
M.	27	0 18	10 32	10 0	10 54	10 0	7 46	8 5	8 8	8 7	4 59	12 2	5 23	
Tu.	28	1 14	11 16	10 1	11 38	10 0	8 29	8 8	8 50	8 7	5 46	12 5	6 8	
W.	29	2 12	12 0	9 11	—	—	9 11	8 5	9 32	8 3	6 30	12 3	6 52	
Th.	30	3 9	0 22	9 10	0 46	9 9	9 53	8 0	10 14	7 8	7 15	11 7	7 38	
F.	31	4 6	1 10	9 7	1 35	9 5	10 36	7 5	10 59	7 1	8 0	10 8	8 22	
Half Mean Spring } Range.			4 ft. 9 in.				3 ft. 10 in.				5 ft. 7 in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°
First Quarter 4 0 19 Afternoon.							1	12	N. 10	9	11	N. 6	17	16 25 25
Full - - - - 12 10 42 Morning.							2	15	28	10	7	39	18	18 8 26
Last Quarter - 20 0 36 Afternoon.							3	17	47	11	3	54	19	19 1 27
New - - - - 27 5 28 Morning.							4	19	0	12	0	2	20	18 57 28
							5	19	10	13	3	50	21	17 52 29
In Apogee - - 13 2 0 Morning.							6	18	19	14	7	33	22	15 43 30
In Perigee - - 26 12 0 Midnight.							7	16	36	15	10	58	23	12 36 31
							8	14	8	16	13	59	24	8 36

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required
 BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9 m.

MARCH, 1865.

GALWAY.						QUEENSTOWN.						WATERFORD.						C's Age AT NOON.					
MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.								
ime.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.							
M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.	D.						
59	15	10	7	22	15	4	7	25	12	6		7	46	13	3	8	7	13	0	3.7			
45	14	9	8	9	14	1	8	8	11	9		8	29	11	4	8	27	12	8	4.7			
34	13	4	9	0	12	7	8	50	10	10		9	13	10	5	9	8	11	10	5.7			
27	11	10	9	58	11	3	9	37	9	11	10	2	9	6		9	51	10	11	6	D		
35	10	10	11	16	10	7	10	35	9	2	11	15	8	11	10	57	10	0			7.7		
—	—		0	2	10	6	12	0	8	10	—	—			—	—			0	15	9	7	8.7
44	10	7	1	23	10	10	0	42	8	11	1	24	9	1	0	55	9	8	1	34	9	9	9.7
57	11	3	2	23	11	8	2	5	9	3	2	37	9	7	2	13	10	0	2	47	10	4	10.7
47	12	1	3	9	12	6	3	2	9	10	3	27	10	2	3	16	10	8	3	42	11	0	11.7
30	12	11	3	47	13	3	3	48	10	6	4	7	10	9	4	6	11	3	4	26	11	6	12.7
4	13	7	4	22	13	11	4	26	11	0	4	44	11	2	4	47	11	8	5	6	11	10	13.7
38	14	2	4	52	14	4	5	1	11	4	5	17	11	5	5	24	12	0	5	39	12	1	0
6	14	6	5	22	14	7	5	33	11	6	5	49	11	7	5	53	12	2	6	9	12	3	15.7
38	14	7	5	54	14	6	6	5	11	7	6	20	11	6	6	25	12	3	6	41	12	3	16.7
9	14	4	6	24	14	2	6	35	11	6	6	50	11	5	6	56	12	2	7	11	12	1	17.7
40	14	0	6	57	13	9	7	6	11	3	7	22	11	1	7	27	12	0	7	42	11	11	18.7
14	13	5	7	32	13	1	7	38	10	10	7	55	10	7	7	58	11	9	8	14	11	7	19.7
52	12	8	8	13	12	2	8	12	10	4	8	30	10	1	8	30	11	4	8	47	11	1	20.7
36	11	8	9	0	11	3	8	50	9	9	9	11	9	6	9	5	10	9	9	25	10	6	21.7
27	10	10	10	1	10	7	9	33	9	3	10	3	9	0	9	49	10	3	10	23	10	0	22.7
40	10	6	11	25	10	7	10	40	8	11	11	23	8	11	11	1	9	9	11	42	9	8	23.7
—	—		0	11	10	10	—	—			0	9	9	1	—	—			0	23	9	10	24.7
51	11	3	1	26	11	10	0	50	9	4	1	30	9	8	1	2	10	1	1	39	10	5	25.7
56	12	6	2	24	13	3	2	6	10	1	2	40	10	7	2	16	10	11	2	52	11	5	26.7
49	13	11	3	13	14	7	3	7	11	1	3	32	11	7	3	22	11	10	3	50	12	4	27.7
34	15	2	3	56	15	8	3	56	12	0	4	19	12	4	4	15	12	9	4	41	13	1	28.7
19	16	1	4	41	16	5	4	43	12	8	5	6	12	10	5	6	13	4	5	29	13	6	29.7
3	16	7	5	27	16	7	5	30	12	11	5	54	12	11	5	51	13	7	6	15	13	7	30.7
51	16	5	6	14	16	2	6	18	12	10	6	40	12	8	6	38	13	6	7	0	13	5	31.7
37	15	9	7	0	15	3	7	2	12	5	7	24	12	1	7	23	13	2	7	45	12	11	32.7
22	14	8	7	45	14	0	7	46	11	8	8	7	11	3	8	6	12	7	8	26	12	3	33.7
San Spring } 7ft. 5in. range.						5ft. 10in.						6ft. 2in.											

Equation of Time at Noon.

M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
2 32	Sub.	9	10 41	Sub.	17	8 27	Sub.	25	6 2	Sub.
2 20		10	10 26		18	8 10		26	5 44	
2 7		11	10 10		19	7 52		27	5 26	
1 54		12	9 53		20	7 34		28	5 7	
1 41		13	9 37		21	7 16		29	4 49	
1 26		14	9 20		22	6 57		30	4 30	
1 12		15	9 2		23	6 39		31	4 12	
0 57		16	8 45		24	6 21				

High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.

APRIL, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.
S.	1	5 22	7 13	17 2	7 38	16 2	9 5	14 6	9 26	14 3	2 50	12 3	3 13	11 10
S.	2	5 55	8 4	15 2	8 34	14 5	9 48	13 5	10 12	13 3	3 37	11 4	4 2	10 10
M.	3	6 45	9 6	13 9	9 44	13 5	10 40	12 4	11 10	12 6	4 31	10 6	5 2	10 10
Tu.	4	7 33	10 25	13 3	11 8	13 3	11 47	11 9	—	—	5 37	9 10	6 16	9 10
W.	5	8 19	11 48	13 5	—	—	0 27	12 3	1 8	11 9	6 57	9 9	7 35	9 10
Th.	6	9 2	0 25	13 10	0 57	14 5	1 47	12 7	2 23	12 3	8 13	10 2	8 47	10 10
F.	7	9 45	1 27	14 11	1 48	15 7	2 54	13 3	3 23	13 0	9 18	10 10	9 40	11 10
S.	8	10 27	2 7	16 2	2 26	16 9	3 48	13 11	4 15	13 9	10 1	11 4	10 21	11 10
S.	9	11 9	2 43	17 3	2 59	17 8	4 32	14 6	4 52	14 4	10 39	11 10	10 56	12 10
M.	10	11 52	3 16	18 0	3 33	18 3	5 10	14 11	5 27	14 10	11 12	12 1	11 29	13 10
Tu.	11	morn.	3 48	18 5	4 4	18 6	5 43	15 1	5 59	15 0	11 44	12 3	12 0	13 10
W.	12	0 36	4 21	18 6	4 36	18 6	6 15	15 1	6 32	15 1	—	—	0 17	13 10
Th.	13	1 21	4 51	18 5	5 6	18 3	6 47	15 0	7 1	14 11	0 33	12 4	0 50	13 10
F.	14	2 9	5 22	18 0	5 38	17 9	7 15	14 8	7 30	14 8	1 6	12 3	1 22	13 10
S.	15	2 58	5 55	17 6	6 13	17 1	7 46	14 3	8 3	13 9	1 39	12 0	1 55	11 10
S.	16	3 49	6 33	16 7	6 53	16 1	8 20	13 8	8 37	13 9	2 14	11 8	2 34	11 10
M.	17	4 41	7 17	15 7	7 44	15 0	8 56	13 1	9 20	13 3	2 54	11 3	3 17	11 10
Tu.	18	5 34	8 11	14 6	8 43	14 2	9 46	12 6	10 14	12 10	3 42	10 10	4 8	10 10
W.	19	6 26	9 18	14 0	9 58	14 1	10 47	12 1	11 23	12 7	4 39	10 5	5 12	10 10
Th.	20	7 19	10 38	14 4	11 18	14 9	—	—	0 5	12 1	5 49	10 2	6 27	10 10
F.	21	8 12	11 58	15 5	—	—	0 48	13 0	1 30	12 9	7 6	10 6	7 45	10 10
S.	22	9 6	0 31	16 1	1 2	16 11	2 10	13 10	2 44	13 9	8 20	11 4	8 53	11 10
S.	23	10 0	1 30	17 9	1 55	18 7	3 16	14 10	3 45	14 10	9 22	12 2	9 50	12 10
M.	24	10 56	2 19	19 4	2 42	20 0	4 13	15 8	4 38	15 9	10 15	12 11	10 39	13 10
Tu.	25	11 53	3 6	20 6	3 30	20 9	5 3	16 3	5 27	16 3	11 2	13 4	11 26	13 10
W.	26	0 51	3 54	20 10	4 18	20 8	5 51	16 5	6 15	16 5	11 50	13 6	—	—
Th.	27	1 50	4 40	20 6	5 1	20 2	6 38	16 5	7 0	16 3	0 14	13 5	0 38	13 10
F.	28	2 48	5 23	19 9	5 46	19 2	7 21	15 11	7 42	15 10	1 1	13 2	1 24	13 10
S.	29	3 44	6 8	18 7	6 30	17 10	8 1	15 3	8 21	15 2	1 47	12 8	2 10	13 10
S.	30	4 37	6 52	17 0	7 17	16 3	8 41	14 4	9 1	14 3	2 32	12 1	2 54	11 10
Half Mean Spring } Range.			9 ft. 6 in.				7 ft. 9 in.				6 ft. 4 in.			
Phases of the Moon.							Moon's Declination at Noon.							
			D. H. M.				M.D. ° ' "				M.D. ° ' "			
First Quarter-			3	1	19	Morning.	1	19	N. 4	9	28	52	17	18 S. 11
Full - - - -			11	4	27	Morning.	2	18	30	10	6	37	18	16 23
Last Quarter -			18	11	20	Afternoon.	3	16	59	11	10	7	19	13 39
New- - - - -			25	2	13	Afternoon.	4	14	42	12	13	15	20	10 4
							5	11	48	13	15	53	21	5 49
In Apogee - -			9	4	0	Morning.	6	8	27	14	17	44	22	1 7
In Perigee - -			24	10	0	Morning.	7	4	48	15	18	49	23	3 N. 43
							8	0	59	16	19	0	24	8 23

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
 Brest add 18 m. | Devonport add 17 m. | Portsmouth add 16 m.

APRIL, 1865.

DOVER.				SHEERNESS.				LONDON.				C's Age AT NOON.
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
Time. H. M. F. I.	Height. L.	Time. H. M. F. I.	Height. L.	Time. H. M. F. I.	Height. L.	Time. H. M. F. I.	Height. L.	Time. H. M. F. I.	Height. L.	Time. H. M. F. I.	Height. L.	
2 31 18 2		2 54 17 6		3 57 15 11		4 19 15 5		5 29 19 2		5 51 18 8		5.3
3 18 16 8		3 44 16 0		4 43 14 10		5 8 14 4		6 14 18 1		6 40 17 6		6.3
4 11 15 3		4 39 14 7		5 36 13 10		6 9 13 5		7 6 16 11		7 36 16 5		7.3
5 12 14 2		5 46 14 0		6 45 13 0		7 25 12 10		8 11 16 0		8 51 15 9		8.3
6 23 14 0		7 1 14 3		8 7 12 10		8 49 12 11		9 32 15 7		10 13 15 6		9.3
7 39 14 8		8 12 15 1		9 26 13 2		10 2 13 5		10 54 15 8		11 29 15 10		10.3
8 42 15 7		9 4 16 0		10 33 13 9		11 2 14 1		— — — —		0 1 16 2		11.3
9 24 16 5		9 44 16 10		11 22 14 5		11 41 14 8		0 28 16 6		0 51 16 9		12.3
0 4 17 2		10 22 17 5		11 59 14 11		— — — —		1 11 17 2		1 29 17 6		13.3
0 40 17 9		10 57 17 11		0 16 15 2		0 32 15 5		1 47 17 10		2 2 18 1		14.3
1 15 18 0		11 32 18 2		0 49 15 7		1 5 15 8		2 18 18 4		2 34 18 6		15.3
1 50 18 2		— — — —		1 21 15 9		1 36 15 10		2 50 18 8		3 5 18 9		16.3
0 7 18 2		0 24 18 1		1 51 15 10		2 7 15 9		3 21 18 10		3 37 18 10		17.3
0 41 18 0		0 59 17 11		2 22 15 8		2 37 15 7		3 51 18 9		4 7 18 8		18.3
1 17 17 9		1 35 17 6		2 52 15 5		3 8 15 3		4 24 18 7		4 39 18 5		19.3
1 54 17 4		2 15 17 0		3 25 15 1		3 43 14 10		4 56 18 3		5 14 18 0		20.3
2 36 16 7		2 58 16 3		4 3 14 7		4 24 14 3		5 33 17 8		5 55 17 5		21.3
3 23 15 9		3 49 15 5		4 47 14 0		5 14 13 8		6 18 17 1		6 44 16 9		22.3
4 18 15 0		4 49 14 9		5 44 13 5		6 19 13 3		7 12 16 6		7 46 16 3		23.3
5 23 14 8		5 57 14 10		6 57 13 2		7 39 13 3		8 25 16 2		9 8 16 2		24.3
6 32 15 3		7 11 15 10		8 19 13 5		8 57 13 10		9 47 16 3		10 25 16 6		25.3
7 46 16 6		8 17 17 2		9 34 14 3		10 7 14 9		11 2 16 10		11 38 17 3		26.3
8 45 17 9		9 13 18 5		10 36 15 2		11 4 15 8		— — — —		0 7 17 9		27.3
9 39 19 0		10 4 19 5		11 28 16 0		11 52 16 5		0 34 18 3		0 57 18 9		28.3
0 30 19 9		10 55 20 0		— — — —		0 15 16 9		1 22 19 2		1 45 19 6		29.3
1 21 20 0		11 47 20 0		0 39 16 11		1 3 17 1		2 8 19 10		2 32 20 1		30.3
— — — —		0 12 19 10		1 26 17 2		1 49 17 0		2 54 20 2		3 18 20 2		31.3
0 36 19 7		1 1 19 4		2 11 16 10		2 32 16 8		3 40 20 1		4 3 19 11		32.3
1 26 18 11		1 49 18 6		2 54 16 5		3 16 16 1		4 25 19 8		4 47 19 3		33.3
2 12 17 11		2 35 17 4		3 38 15 8		4 0 15 3		5 8 18 11		5 30 18 5		34.3
Mean Spring } 9ft. 4in. Tide Range.				8ft. 0in.				9ft. 7in.				

Equation of Time at Noon.

M. S.		M.D.	M. S.		M.D.	M. S.		M.D.	M. S.	
3 54	Sub.	9	1 34	Sub.	17	0 31	Add.	25	2 9	Add.
3 36		10	1 17		18	0 44		26	2 19	
3 18		11	1 1		19	0 58		27	2 29	
3 0		12	0 45		20	1 11		28	2 38	
2 42		13	0 29		21	1 23		29	2 47	
2 25		14	0 13		22	1 36		30	2 55	
2 8		15	0 2	Add.	23	1 47				
1 51		16	0 16		24	1 58				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

TIDE TABLES FOR THE

APRIL, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	5 22	3 15	11 4	3 37	11 0	9 55	19 10	10 18	19 1	6 49	13 6	7 14	13 0
S.	2	5 55	3 59	10 8	4 23	10 5	10 44	18 3	11 16	17 6	7 40	12 5	8 9	11 10
M.	3	6 45	4 50	10 1	5 20	9 10	11 52	16 10	—	—	8 41	11 5	9 16	11 2
Tu.	4	7 33	5 52	9 8	6 31	9 7	0 30	16 3	1 7	15 11	9 55	10 9	10 35	10 4
W.	5	8 19	7 14	9 6	7 57	9 7	1 44	15 10	2 22	16 0	11 15	10 8	11 49	10 11
Th.	6	9 2	8 33	9 9	9 9	9 11	2 56	16 3	3 30	16 10	—	—	0 22	11 3
F.	7	9 45	9 40	10 2	10 10	10 4	4 2	17 4	4 31	17 10	0 52	11 7	1 20	11 12
S.	8	10 27	10 32	10 7	10 51	10 9	4 51	18 4	5 9	18 9	1 41	12 4	2 2	12 5
S.	9	11 9	11 10	10 11	11 28	11 1	5 27	19 2	5 44	19 6	2 22	12 11	2 41	13 2
M.	10	11 52	11 45	11 3	—	—	6 1	19 9	6 19	19 11	2 58	13 5	3 14	13 7
Tu.	11	morn.	0 2	11 4	0 19	11 4	6 36	20 1	6 52	20 3	3 28	13 9	3 44	13 15
W.	12	0 36	0 34	11 5	0 49	11 5	7 8	20 4	7 24	20 4	3 59	14 0	4 15	14 2
Th.	13	1 21	1 5	11 4	1 21	11 4	7 40	20 4	7 56	20 3	4 30	14 1	4 45	14 5
F.	14	2 9	1 37	11 3	1 52	11 2	8 10	20 2	8 26	19 12	5 0	13 10	5 16	13 7
S.	15	2 58	2 8	11 0	2 25	10 11	8 43	19 8	9 0	19 4	5 33	13 5	5 51	13 2
S.	16	3 49	2 42	10 9	3 1	10 7	9 19	19 0	9 39	18 7	6 10	12 10	6 32	12 7
M.	17	4 41	3 21	10 5	3 41	10 4	9 59	18 2	10 23	17 9	6 54	12 3	7 19	12 0
Tu.	18	5 34	4 3	10 2	4 28	10 0	10 52	17 3	11 25	16 11	7 46	11 8	8 16	11 5
W.	19	6 26	4 57	9 10	5 29	9 9	—	—	0 4	16 8	8 51	11 3	9 28	11 2
Th.	20	7 19	6 4	9 9	6 46	9 10	0 42	16 6	1 19	16 6	10 9	11 2	10 46	11 4
F.	21	8 12	7 27	9 11	8 5	10 2	1 54	16 9	2 29	17 4	11 22	11 8	11 56	12 12
S.	22	9 6	8 42	10 6	9 14	10 9	3 4	18 1	3 36	18 11	—	—	0 26	12 8
S.	23	10 0	9 45	11 1	10 14	11 5	4 5	19 7	4 32	20 3	0 55	13 2	1 23	13 5
M.	24	10 56	10 39	11 11	11 4	11 11	4 56	20 10	5 20	21 5	1 50	14 2	2 16	14 6
Tu.	25	11 53	11 28	12 1	11 52	12 3	5 44	21 10	6 9	22 1	2 40	14 10	3 3	15 1
W.	26	0 51	—	—	0 15	12 4	6 33	22 4	6 57	22 4	3 25	15 4	3 48	15 4
Th.	27	1 50	0 38	12 3	1 2	12 2	7 21	22 3	7 45	22 1	4 12	15 4	4 34	15 5
F.	28	2 48	1 26	12 0	1 47	11 10	8 6	21 11	8 28	21 6	4 56	15 1	5 18	14 8
S.	29	3 44	2 10	11 8	2 33	11 5	8 51	20 11	9 14	20 3	5 42	14 3	6 5	13 10
S.	30	4 37	2 56	11 2	3 18	10 11	9 37	19 7	9 59	18 11	6 29	13 4	6 53	12 12
Half Mean Spring Range.			5 ft. 9 in.				10 ft. 5 in.				7 ft. 2 in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M. D.	°	'	M. D.	°	'	M. D.	°
First Quarter	3	1	19	Morning.			1	19	N. 4	9	28	52	17	18 S. 11
Full	11	4	27	Morning.			2	18	30	10	6	37	18	16 23
Last Quarter	18	11	20	Afternoon.			3	16	59	11	10	7	19	13 39
New	25	2	13	Afternoon.			4	14	42	12	13	15	20	10 4
							5	11	48	13	15	50	21	5 49
In Apogee	9	4	0	Morning.			6	8	27	14	17	44	22	1 7
In Perigee	24	10	0	Morning.			7	4	48	15	18	49	23	3 N. 43
							8	0	59	16	19	0	24	8 23

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—

HARWICH subtract 5 m.

HULL add 1 m.

SUNDERLAND add 5 m.

APRIL, 1865.

NORTH SHIELDS.						LEITH.						THURSO.						C's AGE AT NOON.
MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			
Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		
H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.		H. M. F. I.	H. M. F. I.	D.	
5 12 5			7 15 11 11			5 47 15 5			6 12 14 9			—			0 4 11 7			5.3
43 11 4			8 14 10 8			6 39 14 1			7 8 13 6			0 31 10 11			1 0 10 5			6.3
48 10 2			9 26 9 10			7 43 13 0			8 20 12 6			1 33 9 11			2 11 9 6			7.3
8 9 8			10 48 9 7			9 1 12 3			9 42 12 2			2 53 9 3			3 37 9 1			8.3
27 9 9			—			10 21 12 3			10 55 12 5			4 20 9 1			4 56 9 2			9.3
2 9 11			0 35 10 2			11 29 12 9			11 59 13 1			5 31 9 4			6 0 9 9			10.3
4 10 6			1 31 10 9			—			0 25 13 5			6 27 10 2			6 46 10 8			11.3
50 11 1			2 8 11 5			0 45 13 10			1 3 14 3			7 1 11 1			7 17 11 6			12.3
26 11 9			2 43 12 1			1 21 14 8			1 39 15 0			7 32 11 11			7 46 12 3			13.3
58 12 3			3 14 12 6			1 55 15 4			2 11 15 7			8 1 12 7			8 15 12 9			14.3
29 12 8			3 44 12 9			2 28 15 9			2 43 15 10			8 31 12 10			8 45 12 11			15.3
59 12 10			4 15 12 11			2 57 15 11			3 12 15 11			9 0 12 11			9 15 12 10			16.3
31 12 10			4 47 12 8			3 27 15 10			3 43 15 8			9 31 12 8			9 48 12 6			17.3
3 12 6			5 20 12 4			3 58 15 6			4 14 15 4			10 5 12 4			10 22 12 1			18.3
37 12 2			5 55 12 0			4 31 15 1			4 49 14 11			10 40 11 10			11 0 11 6			19.3
14 11 9			6 35 11 6			5 8 14 8			5 30 14 5			11 22 11 2			11 44 10 11			20.3
56 11 3			7 21 10 11			5 52 14 1			6 18 13 8			—			0 9 10 7			21.3
50 10 7			8 22 10 3			6 45 13 4			7 17 13 1			0 37 10 2			1 8 10 0			22.3
0 10 1			9 40 10 0			7 54 12 10			8 32 12 9			1 45 9 9			2 24 9 8			23.3
21 10 1			10 58 10 4			9 15 12 9			9 53 13 0			3 8 9 8			3 51 9 10			24.3
35 10 9			—			10 28 13 4			11 3 13 9			4 28 10 1			5 5 10 5			25.3
9 11 1			0 40 11 7			11 33 14 3			—			5 35 10 11			6 3 11 6			26.3
7 12 0			1 32 12 6			0 1 14 9			0 26 15 4			6 27 12 2			6 48 12 10			27.3
56 12 11			2 19 13 5			0 50 15 11			1 14 16 6			7 9 13 4			7 29 13 11			28.3
41 13 9			3 3 14 1			1 38 16 11			2 1 17 3			7 50 14 3			8 12 14 6			29.3
26 14 3			3 49 14 4			2 24 17 6			2 46 17 6			8 34 14 6			8 57 14 4			30.3
13 14 3			4 36 14 0			3 9 17 5			3 31 17 2			9 20 14 2			9 43 13 10			31.3
59 13 9			5 22 13 5			3 53 16 10			4 16 16 6			10 6 13 6			10 30 13 1			32.3
46 13 1			6 9 12 8			4 40 16 1			5 3 15 8			10 54 12 7			11 18 12 0			33.3
32 12 3			6 56 11 9			5 27 15 2			5 51 14 8			11 43 11 6			—			34.3
Mean Spring } 6ft. 8in.						8ft. 2in.						6ft. 7in.						

Equation of Time at Noon.

M. S.		M.D.	M. S.		M.D.	M. S.		M.D.	M. S.	
3 54	Sub.	9	1 34	Sub.	17	0 31	Add.	25	2 9	Add.
3 36		10	1 17		18	0 44		26	2 19	
3 18		11	1 1		19	0 58		27	2 29	
3 0		12	0 45		20	1 11		28	2 38	
2 42		13	0 29		21	1 23		29	2 47	
2 25		14	0 13		22	1 36		30	2 55	
2 8		15	0 2	Add.	23	1 47				
1 51		16	0 16		24	1 58				

of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required—for
NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

APRIL, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.																																																																																																																																																																																																																																																																																																																																																																																																																																														
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																																																																																																																																																																																																																																																																																																																																																																																																																																										
			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.																																																																																																																																																																																																																																																																																																																																																																																																																																									
S.	1	5 2	3 14	9 7	3 36	9 4	2 24	24 9	2 46	23 9	9 37	19 2	10 0	18 1	S.	2	5 55	4 0	9 1	4 26	8 10	3 11	22 9	3 38	21 9	10 34	17 5	10 49	16 6	M.	3	6 45	4 55	8 7	5 27	8 4	4 9	20 10	4 44	20 0	11 14	15 8	11 49	13 6	Tu.	4	7 33	6 3	8 2	6 42	8 1	5 25	19 8	6 7	19 6	—	—	0 24	15 2	W.	5	8 19	7 23	8 0	8 0	8 1	6 52	19 8	7 29	19 11	1 5	15 0	1 47	15 2	Th.	6	9 2	8 37	8 3	9 9	8 5	8 5	20 7	8 36	21 1	2 38	15 7	3 2	16 3	F.	7	9 45	9 39	8 7	10 2	8 9	9 4	21 9	9 24	22 5	3 35	16 10	3 59	17 12	S.	8	10 27	10 22	8 11	10 41	9 0	9 43	23 0	10 1	23 7	4 21	18 0	4 43	18 2	S.	9	11 9	11 0	9 1	11 19	9 2	10 17	24 0	10 33	24 4	5 5	19 1	5 24	19 3	M.	10	11 52	11 37	9 3	11 54	9 4	10 50	24 8	11 7	24 11	5 42	19 9	5 59	20 0	Tu.	11	morn.	—	—	0 11	9 5	11 23	25 1	11 39	25 3	6 15	20 2	6 30	20 4	W.	12	0 36	0 27	9 6	0 44	9 6	11 56	25 4	—	—	6 47	20 5	7 3	20 7	Th.	13	1 21	1 0	9 6	1 16	9 6	0 11	25 4	0 27	25 3	7 18	20 4	7 33	20 6	F.	14	2 9	1 32	9 6	1 48	9 5	0 43	25 1	0 59	24 10	7 48	19 11	8 4	19 8	S.	15	2 58	2 5	9 5	2 21	9 4	1 15	24 5	1 31	24 1	8 22	19 4	8 41	19 6	S.	16	3 49	2 39	9 3	2 58	9 1	1 49	23 7	2 8	23 1	9 0	18 6	9 19	18 8	M.	17	4 41	3 17	9 0	3 40	8 11	2 28	23 7	2 51	22 1	9 40	17 7	10 4	17 12	Tu.	18	5 34	4 6	8 9	4 33	8 8	3 17	21 6	3 44	21 0	10 29	16 8	10 55	16 0	W.	19	6 26	5 4	8 6	5 38	8 5	4 19	20 6	4 56	20 4	11 25	15 11	11 59	15 10	Th.	20	7 19	6 16	8 4	6 53	8 4	5 39	20 4	6 22	20 9	—	—	0 34	16 6	F.	21	8 12	7 31	8 6	8 9	8 9	7 1	21 4	7 38	22 2	1 16	16 6	1 59	17 0	S.	22	9 6	8 43	8 11	9 15	9 2	8 11	23 0	8 39	23 11	2 35	17 11	3 10	18 9	S.	23	10 0	9 43	9 5	10 10	9 7	9 6	24 10	9 30	25 8	3 41	18 8	4 10	20 8	M.	24	10 56	10 36	9 9	11 1	9 11	9 53	26 5	10 16	27 0	4 38	21 2	5 5	21 0	Tu.	25	11 53	11 27	10 1	11 52	10 2	10 40	27 5	11 4	27 9	5 32	22 3	5 56	22 6	W.	26	0 51	—	—	0 17	10 3	11 28	27 10	11 53	27 10	6 20	22 8	6 44	22 8	Th.	27	1 50	0 41	10 3	1 5	10 2	—	—	0 16	27 7	7 6	22 5	7 28	22 5	F.	28	2 48	1 28	10 1	1 50	10 0	0 39	27 3	1 1	26 9	7 50	21 8	8 14	21 8	S.	29	3 44	2 13	9 10	2 34	9 8	1 23	26 1	1 45	25 5	8 37	20 5	8 59	19 7	S.	30	4 37	2 56	9 6	3 17	9 3	2 7	24 5	2 28	23 6	9 20	18 11	9 41	18 5
Half Mean Spring Range.			4 ft. 10 in.								13 ft. 0 in.								10 ft. 6 in.																																																																																																																																																																																																																																																																																																																																																																																																																																														
Phases of the Moon.																Moon's Declination at Noon.																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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Last Quarter - 18 11 20 Afternoon.																3 16 59 11 10 7 19 13 39 27 17 59																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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In Apogee - - 9 4 0 Morning.																6 8 27 14 17 44 22 1 7 30 17 35																																																																																																																																																																																																																																																																																																																																																																																																																																																	
In Perigee - - 24 10 0 Morning.																7 4 48 15 18 49 23 3 N. 43																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,

GREENOCK add 18 m.

LIVERPOOL add 18 m.

PEMBROKE add 20 m.

APRIL, 1864.

WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's Age at Noon.
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			
10 10 34 8				10 29 33 1				1 21 15 3				1 45 14 8				2 21 10 4				2 45 10 0				5.3
10 50 31 7				11 16 30 2				2 12 14 0				2 41 13 5				3 11 9 8				3 39 9 5				6.3
11 47 28 11				— — — —				3 14 12 11				3 52 12 6				4 13 9 1				4 50 8 10)
0 23 28 2				1 1 27 10				4 34 12 4				5 15 12 3				5 27 8 8				6 4 8 7				8.3
1 43 27 10				2 22 28 1				5 55 12 4				6 29 12 6				6 41 8 9				7 16 8 11				9.3
3 0 28 8				3 36 29 6				7 3 12 10				7 32 13 2				7 50 9 1				8 22 9 3				10.3
4 11 30 5				4 37 31 5				8 0 13 6				8 20 13 10				8 52 9 5				9 14 9 8				11.3
5 1 32 4				5 24 33 3				8 38 14 2				8 56 14 6				9 35 9 10				9 55 10 1				12.3
5 45 34 0				6 4 34 7				9 12 14 10				9 28 15 0				10 12 10 3				10 27 10 4				13.3
6 23 35 2				6 41 35 6				9 45 15 3				10 1 15 5				10 42 10 6				10 57 10 7				14.3
6 57 35 10				7 13 36 1				10 16 15 6				10 30 15 7				11 12 10 8				11 27 10 9				15.3
7 30 36 3				7 46 36 4				10 44 15 7				10 58 15 7				11 43 10 9				11 59 10 8				16.3
8 1 36 2				8 16 35 11				11 13 15 6				11 28 15 4				— — — —				0 16 10 7				17.3
8 31 35 8				8 47 35 4				11 45 15 2				— — — —				0 32 10 6				0 49 10 5				18.3
9 2 34 11				9 19 34 5				0 3 15 0				0 21 14 9				1 6 10 4				1 24 10 2				19.3
9 36 33 8				9 53 32 11				0 42 14 6				1 4 14 2				1 43 10 0				2 4 9 9				20.3
10 11 32 2				10 32 31 3				1 27 13 11				1 51 13 7				2 26 9 7				2 50 9 6				21.3
10 56 30 6				11 24 29 9				2 18 13 3				2 49 13 0				3 17 9 4				3 47 9 2				22.3
11 58 29 3				— — — —				3 26 12 10				4 5 12 9				4 24 9 0				5 2 8 11				23.3
0 35 29 2				1 13 29 6				4 48 12 10				5 26 13 0				5 39 8 11				6 15 8 12				24.3
1 52 30 2				2 32 31 2				6 2 13 5				6 37 13 10				6 50 9 4				7 24 9 7				25.3
3 9 32 4				3 45 33 7				7 7 14 4				7 35 14 10				7 56 9 11				8 27 10 2				26.3
4 19 34 11				4 51 36 3				8 2 15 4				8 26 15 10				8 56 10 6				9 24 10 9				27.3
5 19 37 6				5 46 38 5				8 49 16 3				9 11 16 8				9 48 11 0				10 10 11 3				28.3
6 12 39 2				6 38 39 7				9 34 16 11				9 57 17 1				10 32 11 5				10 54 11 7				29.3
7 3 39 10				7 27 39 11				10 19 17 2				10 41 17 11				11 17 11 8				11 40 11 7				30.3
7 50 39 7				8 11 39 1				11 2 16 11				11 23 16 8				— — — —				0 3 11 5				1.9
8 33 38 6				8 54 37 8				11 47 16 5				— — — —				0 26 11 3				0 50 11 1				2.9
9 14 36 9				9 34 35 7				0 12 16 0				0 37 15 6				1 14 10 10				1 38 10 6				3.9
9 53 34 4				10 12 33 2				1 1 15 0				1 25 14 6				2 1 10 3				2 25 10 0				4.9
Mean Spring } Range.				18ft. 7in.				8ft. 0in.				5ft. 6in.												

Equation of Time at Noon.

M. S.		M.D.	M. S.		M.P.	M. S.		M.D.	M. S.	
3 54	Sub.	9	1 34	Sub.	17	0 31	Add.	25	2 9	Add.
3 36		10	1 17		18	0 44		26	2 19	
3 18		11	1 1		19	0 58		27	2 29	
3 0		12	0 45		20	1 11		28	2 38	
2 42		13	0 29		21	1 23		29	2 47	
2 25		14	0 13		22	1 36		30	2 55	
2 8		15	0 2	Add.	23	1 47				
1 51		16	0 16		24	1 58				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
WESTON-SUPER-MARE add 12 m, HOLYHEAD add 18 m, KINGSTOWN subtract 1 m. for Dublin Time.

APRIL, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.
S.	1	5 22	2 0	9 2	2 26	8 11	11 27	6 8	12 0	6 3	8 46	9 9	9 14	
M.	2	5 55	2 54	8 8	3 23	8 6	—	—	0 37	5 10	9 47	8 10	10 23	
Tu.	3	6 45	3 56	8 3	4 31	8 1	1 18	5 8	2 2	5 6	11 1	8 3	11 40	
W.	4	7 33	5 8	8 0	5 45	7 11	2 45	5 5	3 23	5 7	—	—	0 19	
Th.	5	8 19	6 25	7 11	7 1	7 11	4 0	5 9	4 31	5 11	0 59	8 2	1 35	
F.	6	9 2	7 37	8 0	8 7	8 2	4 59	6 1	5 24	6 3	2 9	8 5	2 39	
S.	7	9 45	8 34	8 4	8 53	8 7	5 47	6 5	6 4	6 7	3 5	9 0	3 25	
M.	8	10 27	9 12	8 9	9 31	8 11	6 22	6 9	6 41	6 11	3 41	9 8	3 58	
Tu.	9	11 9	9 48	9 11	10 5	9 1	6 59	7 1	7 16	7 2	4 14	10 2	4 30	
W.	10	11 52	10 21	9 2	10 36	9 3	7 34	7 3	7 51	7 4	4 47	10 7	5 4	
Th.	11	morn.	10 52	9 3	11 6	9 4	8 6	7 5	8 20	7 6	5 20	10 10	5 36	
F.	12	0 36	11 21	9 3	11 36	9 3	8 35	7 6	8 48	7 6	5 52	11 0	6 6	
S.	13	1 21	11 51	9 3	—	—	9 3	7 4	9 17	7 3	6 21	10 10	6 37	
M.	14	2 9	0 7	9 2	0 24	9 2	9 32	7 1	9 48	7 0	6 53	10 6	7 10	
Tu.	15	2 58	0 42	9 1	1 0	9 0	10 4	6 10	10 22	6 8	7 27	10 0	7 46	
W.	16	3 49	1 21	8 11	1 43	8 10	10 42	6 6	11 5	6 3	8 5	9 6	8 27	
Th.	17	4 41	2 7	8 8	2 33	8 7	11 36	6 1	—	—	8 52	9 0	9 23	
F.	18	5 34	3 1	8 5	3 31	8 4	0 10	5 10	0 48	5 11	9 56	8 6	10 35	
S.	19	6 26	4 6	8 3	4 43	8 2	1 31	5 7	2 17	5 11	11 14	8 5	11 54	
M.	20	7 19	5 21	8 2	5 57	8 2	2 58	5 9	3 34	6 0	—	—	0 31	
Tu.	21	8 12	6 33	8 3	7 10	8 4	4 6	6 4	4 35	6 8	1 7	8 11	1 43	
W.	22	9 6	7 41	8 7	8 9	8 10	4 59	6 11	5 23	7 2	2 14	9 7	2 41	
Th.	23	10 0	8 35	9 1	9 0	9 4	5 46	7 5	6 10	7 8	3 6	10 5	3 28	
F.	24	10 56	9 24	9 7	9 47	9 9	6 35	7 11	6 59	8 1	3 50	11 3	4 13	
S.	25	11 53	10 10	9 10	10 33	9 11	7 24	8 3	7 48	8 4	4 37	11 10	5 1	
M.	26	0 51	10 56	9 11	11 19	9 10	8 10	8 5	8 32	8 11	5 25	12 1	5 48	
Tu.	27	1 50	11 40	9 9	—	—	8 52	8 2	9 12	8 0	6 10	11 11	6 32	
W.	28	2 48	0 2	9 8	0 26	9 7	9 33	7 9	9 55	7 6	6 55	11 4	7 16	
Th.	29	3 44	0 51	9 5	1 15	9 4	10 17	7 3	10 40	6 11	7 41	10 6	8 3	
F.	30	4 37	1 40	9 2	2 6	8 11	11 4	6 7	11 35	6 4	8 26	9 8	8 51	
Half Mean Spring Range.			4 ft. 9 in.				3 ft. 10 in.				5 ft. 7 in.			
Phases of the Moon.							Moon's Declination at Noon.							
			D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°
First Quarter-			3	1	19	Morning.	1	19	N. 4	9	28	52	17	18
Full - - - -			11	4	27	Morning.	2	18	30	10	6	37	18	16
Last Quarter -			18	11	20	Afternoon.	3	16	59	11	10	7	19	13
New - - - -			25	2	13	Afternoon.	4	14	42	12	13	15	20	10
							5	11	48	13	15	50	21	5
In Apogee - -			9	4	0	Morning.	6	8	27	14	17	44	22	1
In Perigee - -			24	10	0	Morning.	7	4	48	15	18	49	23	3
							8	0	59	16	19	0	24	8

The times for High Water are given for Mean Time at Place; if Dublin or Railway Time be required
 BELFAST subtract 2 m. | LONDONDERRY add 4 m. | SLIGO BAY add 9

APRIL, 1865.

MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's Age at Noon.
	MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	
1	8 10	13 4	8 36	12 6	8 28	10 10	8 50	10 4	8 46	11 10	9 7	11 4	5'3
2	9 4	11 10	9 35	11 3	9 15	9 11	9 41	9 6	9 29	10 11	9 58	10 6	6'3
3	10 10	10 9	10 49	10 6	10 11	9 2	10 48	8 11	10 33	10 1	11 9	9 9	7'3
4	11 30	10 6	—	—	11 27	8 10	—	—	11 45	9 7	—	—	8'3
5	0 11	10 6	0 46	10 8	0 9	8 10	0 47	8 11	0 22	9 7	0 58	9 8	9'3
6	1 21	11 0	1 50	11 5	1 24	9 2	1 59	9 5	1 33	9 10	2 7	10 2	10'3
7	2 17	11 10	2 38	12 3	2 31	9 8	2 54	9 11	2 42	10 5	3 7	10 9	11'3
8	2 57	12 7	3 16	12 11	3 15	10 3	3 35	10 6	3 29	11 0	3 53	11 3	12'3
9	3 34	13 3	3 50	13 6	3 55	10 9	4 13	10 11	4 14	11 6	4 34	11 8	13'3
10	4 7	13 9	4 23	14 0	4 30	11 1	4 47	11 3	4 53	11 10	5 10	11 11	14'3
11	4 39	14 2	4 54	14 4	5 3	11 4	5 20	11 5	5 26	12 0	5 41	12 1	15'3
12	5 10	14 5	5 26	14 5	5 37	11 6	5 53	11 5	5 57	12 1	6 13	12 1	16'3
13	5 42	14 3	5 58	14 1	6 9	11 5	6 24	11 4	6 29	12 1	6 45	12 0	17'3
14	6 14	13 11	6 31	13 9	6 40	11 3	6 57	11 1	7 2	12 0	7 18	11 11	18'3
15	6 49	13 6	7 8	13 3	7 14	10 11	7 32	10 9	7 34	11 10	7 52	11 8	19'3
16	7 29	12 11	7 51	12 6	7 51	10 6	8 10	10 3	8 11	11 6	8 29	11 3	20'3
17	8 15	12 2	8 42	11 8	8 31	10 0	8 55	9 9	8 48	11 0	9 10	10 9	21'3
18	9 11	11 4	9 45	11 1	9 21	9 7	9 49	9 4	9 35	10 7	10 8	10 4	22'3
19	10 22	10 11	11 3	11 0	10 22	9 3	11 1	9 3	10 44	10 2	11 21	10 1	23'3
20	11 42	11 3	—	—	11 39	9 4	—	—	11 56	10 1	—	—	24'3
21	0 19	11 8	0 55	12 2	0 17	9 7	0 55	9 11	0 31	10 4	1 6	10 8	25'3
22	1 25	12 9	1 53	13 3	1 32	10 3	2 6	10 7	1 41	11 0	2 16	11 5	26'3
23	2 20	13 10	2 46	14 5	2 35	11 0	3 4	11 5	2 49	11 10	3 20	12 2	27'3
24	3 10	14 11	3 33	15 3	3 30	11 10	3 55	12 1	3 48	12 7	4 16	12 10	28'3
25	3 57	15 8	4 21	15 11	4 20	12 4	4 44	12 6	4 43	13 1	5 7	13 2	29'3
26	4 44	16 1	5 7	16 1	5 9	12 7	5 33	12 7	5 30	13 2	5 54	13 3	30'3
27	5 30	15 11	5 53	15 7	5 57	12 6	6 20	12 4	6 17	13 1	6 40	13 0	31'3
28	6 16	15 3	6 40	14 10	6 42	12 1	7 5	11 10	7 4	12 10	7 26	12 7	32'3
29	7 3	14 4	7 26	13 9	7 27	11 5	7 49	11 1	7 47	12 4	8 9	12 0	33'3
30	7 50	13 2	8 15	12 7	8 10	10 9	8 31	10 4	8 28	11 8	8 49	11 4	34'3
If Mean Spring } Range.				7ft. 5in.	5ft. 10in.				6ft. 2in.				

Equation of Time at Noon.

M. S.		M. D.	M. S.		M. D.	M. S.		M. D.	M. S.	
3 54	Sub.	9	1 34	Sub.	17	0 31	Add.	25	2 9	Add.
3 36		10	1 17		18	0 44		26	2 19	
3 18		11	1 1		19	0 58		27	2 29	
3 0		12	0 45		20	1 11		28	2 38	
2 42		13	0 29		21	1 23		29	2 47	
2 25		14	0 13		22	1 36		30	2 55	
2 8		15	0 2	Add.	23	1 47				
1 51		16	0 16		24	1 58				

Times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
 GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 1 m.

MAY, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	H. M.	F. L.	
M.	1	5 27	7 43	15 5	8 10	14 8	9 24	13 4	9 48	13 4	3 17	11 5	3 42	11 5	
Tu.	2	6 15	8 39	14 1	9 9	13 8	10 12	12 4	10 39	12 7	4 7	10 8	4 34	10 8	
W.	3	6 59	9 44	13 6	10 22	13 6	11 8	11 8	11 44	12 3	5 4	10 1	5 37	9 1	
Th.	4	7 42	10 58	13 6	11 33	13 9	—	—	0 24	11 8	6 13	9 10	6 47	9 10	
F.	5	8 25	—	—	0 7	14 1	1 0	12 5	1 35	12 1	7 21	10 0	7 54	10 0	
S.	6	9 7	0 34	14 6	1 2	14 11	2 10	12 11	2 38	12 10	8 24	10 6	8 59	10 6	
M.	7	9 49	1 28	15 5	1 47	15 11	3 6	13 6	3 31	13 7	9 20	11 0	9 41	11 0	
Tu.	8	10 33	2 6	16 5	2 25	16 10	3 54	14 1	4 16	14 10	10 11	11 6	10 20	11 6	
W.	9	11 18	2 42	17 3	2 59	17 8	4 36	14 5	4 55	14 6	10 37	11 10	10 55	11 10	
Th.	10	12 0	3 17	17 11	3 35	18 0	5 13	14 9	5 31	14 10	11 14	12 0	11 32	12 0	
F.	11	0 5	3 53	18 1	4 10	18 1	5 47	14 11	6 4	15 0	11 49	12 2	—	—	
S.	12	0 55	4 27	18 1	4 45	18 1	6 21	14 11	6 38	15 1	0 6	12 2	0 24	12 2	
M.	13	1 46	5 2	18 0	5 20	17 10	6 55	14 9	7 11	15 0	0 43	12 1	1 2	12 1	
Tu.	14	2 38	5 38	17 8	5 59	17 5	7 28	14 6	7 47	14 8	1 20	12 0	1 40	12 0	
W.	15	3 30	6 21	17 1	6 43	16 8	8 7	14 0	8 26	14 4	2 0	11 10	2 21	11 10	
Th.	16	4 23	7 6	16 3	7 32	15 11	8 47	13 6	9 9	13 10	2 43	11 7	3 7	11 7	
F.	17	5 15	8 0	15 5	8 30	15 1	9 34	13 0	10 1	13 4	3 31	11 1	3 58	12 1	
S.	18	6 7	9 2	14 11	9 36	14 11	10 33	12 7	11 7	13 1	4 27	10 11	4 58	10 11	
M.	19	6 58	10 13	15 1	10 49	15 4	11 43	12 6	—	—	5 30	10 8	6 4	10 8	
Tu.	20	7 50	11 25	15 8	12 0	16 2	0 24	13 3	1 4	13 1	6 38	10 9	7 13	11 1	
W.	21	8 43	—	—	0 31	16 8	1 43	13 11	2 19	13 11	7 48	11 4	8 22	11 4	
Th.	22	9 38	1 0	17 3	1 29	17 11	2 50	14 7	3 21	14 9	8 52	12 0	9 23	12 0	
F.	23	10 34	1 57	18 6	2 23	19 0	3 50	15 2	4 18	15 4	9 53	12 6	10 19	12 6	
S.	24	11 32	2 47	19 5	3 12	19 8	4 44	15 7	5 9	15 9	10 44	12 10	11 8	12 10	
M.	25	0 31	3 36	19 9	4 1	19 8	5 33	15 11	5 57	16 0	11 33	13 0	11 58	13 0	
Tu.	26	1 29	4 24	19 7	4 46	19 5	6 20	15 10	6 45	16 1	—	—	0 22	13 0	
W.	27	2 24	5 7	19 1	5 29	18 8	7 0	15 7	7 22	15 9	0 45	12 9	1 8	13 0	
Th.	28	3 17	5 51	18 3	6 13	17 10	7 42	15 0	8 2	15 2	1 31	12 5	1 50	13 0	
F.	29	4 7	6 35	17 2	6 57	16 7	8 21	14 3	8 40	14 5	2 14	12 0	2 36	12 1	
S.	30	4 54	7 20	16 0	7 44	15 5	8 59	13 5	9 20	13 7	2 58	11 6	3 20	12 1	
M.	31	5 38	8 7	14 10	8 32	14 4	9 40	12 7	10 2	12 9	3 43	11 0	4 6	12 0	
Half Mean Spring Range.			9 ft. 6 in.				7 ft. 9 in.				6 ft. 4 in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'
First Quarter	2	4	4	Afternoon.	1	15 N. 29	9	12	8.27	17	11	8. 6	25	18 N. 4	
Full	10	8	23	Afternoon.	2	12 42	10	15	13	18	7	7	26	19	
Last Quarter	18	6	39	Morning.	3	9 26	11	17	21	19	2	39	27	18	
New	24	10	49	Afternoon.	4	5 50	12	18	40	20	2	N. 1	28	16	
In Apogee	6	4	0	Afternoon.	6	1 8.49	14	18	30	22	10	56	30	10	
In Perigee	22	0	0	Noon.	7	5 36	15	16	56	23	14	32	31	7	
					8	9 12	16	14	26	24	17	12			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
 Brest add 18 m. Devonport add 17 m. Portsmouth add 4 m.

MAY, 1865.

MONTH DAY.	DOVER.								SHEERNESS.								LONDON.								C's AGE AT NOON.																																																																																																																																																																																																																														
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																																																																																																																																																																																																																																		
	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.																																																																																																																																																																																																																																				
1	2 58 16 9	3 23 16 2	4 23 14 9	4 47 14 4	5 53 18 0	6 18 17 6	5 9	2	3 48 15 7	4 14 15 0	5 14 13 11	5 43 13 7	6 44 17 0	7 11 16 7	7 9	3	4 41 14 6	5 11 14 3	6 14 13 3	6 48 13 0	7 42 16 3	8 16 15 11	7 9	4	5 42 14 2	6 14 14 2	7 24 12 11	8 4 12 11	8 53 15 10	9 29 15 8	8 9	5	6 47 14 5	7 20 14 10	8 39 13 1	9 12 13 3	10 3 15 8	10 38 15 10	9 9	6	7 49 15 2	8 18 15 6	9 44 13 7	10 11 13 10	11 13 16 0	11 43 16 3	10 9	7	8 43 15 11	9 4 16 3	10 38 14 1	11 2 14 4	—	0 9 16 6	11 9	8	9 24 16 7	9 44 16 11	11 21 14 7	11 39 14 10	0 32 16 9	0 51 17 0	12 9	9	10 3 17 2	10 23 17 5	11 57 15 0	—	1 11 17 4	1 31 17 7	13 9	10	10 42 17 8	11 1 17 9	0 14 15 2	0 32 15 4	1 48 17 10	2 4 18 1	0	11	11 21 17 10	11 39 17 10	0 50 15 6	1 8 15 7	2 20 18 3	2 37 18 4	15 9	12	11 58 17 11	—	1 25 15 8	1 42 15 7	2 56 18 6	3 12 18 7	16 9	13	0 18 18 0	0 37 17 10	1 59 15 7	2 16 15 6	3 29 18 7	3 45 18 7	17 9	14	0 57 17 9	1 18 17 8	2 33 15 5	2 50 15 4	4 2 18 6	4 21 18 5	18 9	15	1 40 17 6	2 2 17 4	3 8 15 3	3 29 15 1	4 40 18 4	4 59 18 2	19 9	16	2 24 17 1	2 47 16 9	3 50 14 10	4 12 14 7	5 20 18 0	5 40 17 9	20 9	17	3 12 16 6	3 39 16 2	4 37 14 5	5 2 14 2	6 3 17 7	6 30 17 4	21 9	18	4 7 15 11	4 36 15 8	5 32 14 0	6 5 13 10	6 57 17 1	7 27 16 11	22 9	19	5 5 15 5	5 35 15 6	6 40 13 8	7 16 13 8	8 2 16 9	8 41 16 8	23 9	20	6 6 15 8	6 39 16 0	7 55 13 10	8 30 14 1	9 20 16 9	9 56 16 10	24 9	21	7 14 16 6	7 46 17 0	9 4 14 5	9 37 14 9	10 33 17 1	11 8 17 4	25 9	22	8 16 17 5	8 46 17 10	10 7 15 1	10 35 15 5	11 40 17 7	—	26 9	23	9 16 18 3	9 43 18 7	11 3 15 8	11 37 15 11	0 9 17 11	0 36 18 3	27 9	24	10 10 18 11	10 36 19 11	11 56 16 2	—	1 3 18 7	1 29 18 11	28 9	25	11 3 19 2	11 30 19 2	0 21 16 5	0 45 16 6	1 54 19 2	2 17 19 4	0 5	26	11 56 19 1	—	1 9 16 7	1 33 16 6	2 40 19 6	3 4 19 6	1 5	27	0 19 19 0	0 43 18 9	1 56 16 5	2 17 16 3	3 26 19 6	3 47 19 5	2 5	28	1 8 18 6	1 31 18 2	2 38 16 1	2 59 15 10	4 7 19 3	4 29 19 0	3 5	29	1 54 17 10	2 17 17 5	3 21 15 6	3 43 15 3	4 51 18 9	5 12 18 5	4 5	30	2 39 17 0	3 1 16 6	4 5 14 11	4 27 14 7	5 34 18 1	5 57 17 9	5 5	31	3 24 16 1	3 47 15 8	4 50 14 3	5 14 13 11	6 20 17 5	6 45 17 0	6 5
Half Mean Spring } Range.								9ft. 4in.								8ft. 0in.								9ft. 7in.																																																																																																																																																																																																																															

Equation of Time at Noon.

M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
3	3		9	3	45		17	3	51		25	3	20	
3	10		10	3	48		18	3	49		26	3	14	
3	17		11	3	50		19	3	47		27	3	8	
3	23		12	3	52		20	3	44		28	3	0	
3	28		13	3	53		21	3	40		29	2	53	
3	33		14	3	53		22	3	36		30	2	45	
3	38		15	3	53		23	3	31		31	2	36	
3	42		16	3	52		24	3	26					

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

MAY, 1865.

Week Day.	Month Day.	Moon's Transit.	HARWICH.				HULL.				SUNDERLAND.					
			Morning.		Afternoon.		Morning.		Afternoon.		Morning.		Afternoon.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.		
		H. M.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.		
M.	1	5 27	3 40	10 8	4 3	10 5	10 23	18 4	10 52	17 8	7 19	12 5	7 46	11 13		
Tu.	2	6 15	4 28	10 2	4 56	9 11	11 24	17 1	11 58	16 7	8 15	11 7	8 45	11 3		
W.	3	6 59	5 24	9 9	5 55	9 7	—	—	0 33	16 3	9 19	11 0	9 55	10 10		
Th.	4	7 42	6 31	9 7	7 12	9 7	1 7	16 1	1 40	16 0	10 32	10 9	11 5	10 10		
F.	5	8 25	7 47	9 8	8 20	9 10	2 12	16 2	2 42	16 6	11 36	11 0	—	—		
S.	6	9 7	8 51	10 0	9 18	10 2	3 11	17 0	3 39	17 5	0 3	11 4	0 30	11 8		
S.	7	9 49	9 45	10 4	10 11	10 6	4 7	17 10	4 31	18 3	0 57	11 11	1 21	13 9		
M.	8	10 33	10 32	10 8	10 50	10 10	4 50	18 7	5 8	18 11	1 42	12 6	2 2	13 6		
Tu.	9	11 18	11 9	11 0	11 27	11 1	5 26	19 3	5 43	19 5	2 21	13 0	2 39	13 8		
W.	10	morn.	11 45	11 2	—	—	6 1	19 8	6 20	19 10	2 57	13 4	3 14	13 6		
Th.	11	0 5	0 4	11 3	0 21	11 3	6 39	19 11	6 56	20 0	3 31	13 8	3 48	13 9		
F.	12	0 55	0 38	11 3	0 54	11 3	7 13	20 0	7 31	20 0	4 5	13 9	4 22	13 10		
S.	13	1 46	1 12	11 2	1 30	11 1	7 49	20 0	8 6	19 11	4 39	13 9	4 56	13 8		
S.	14	2 38	1 48	11 0	2 6	10 11	8 24	19 9	8 43	19 7	5 14	13 6	5 34	13 4		
M.	15	3 30	2 26	10 10	2 47	10 9	9 5	19 3	9 27	19 0	5 55	13 1	6 18	13 10		
Tu.	16	4 23	3 9	10 8	3 31	10 6	9 49	18 8	10 12	18 4	6 42	12 8	7 8	13 1		
W.	17	5 15	3 53	10 5	4 17	10 3	10 38	18 1	11 11	17 9	7 35	12 3	8 5	13 0		
Th.	18	6 7	4 46	10 2	5 16	10 1	11 47	17 6	—	—	8 37	11 10	9 11	11 1		
F.	19	6 58	5 48	10 1	6 22	10 1	0 25	17 4	1 0	17 3	9 47	11 8	10 22	11 1		
S.	20	7 50	7 2	10 2	7 38	10 4	1 32	17 5	2 4	17 9	10 56	11 11	11 28	12 3		
S.	21	8 43	8 12	10 7	8 44	10 9	2 34	18 2	3 5	18 10	11 57	12 8	—	—		
M.	22	9 38	9 14	11 0	9 44	11 3	3 36	19 4	4 4	19 10	0 26	13 0	0 54	13 1		
Tu.	23	10 34	10 14	11 5	10 42	11 7	4 32	20 4	4 59	20 9	1 24	13 9	1 54	14 1		
W.	24	11 32	11 8	11 9	11 33	11 11	5 24	21 0	5 49	21 3	2 20	14 3	2 45	14 1		
Th.	25	0 31	11 58	11 11	—	—	6 15	21 4	6 40	21 5	3 9	14 8	3 32	14 1		
F.	26	1 29	0 22	11 11	0 46	11 10	7 5	21 5	7 29	21 4	3 56	14 9	4 19	14 1		
S.	27	2 24	1 10	11 9	1 32	11 7	7 51	21 2	8 12	20 11	4 40	14 7	5 2	14 1		
S.	28	3 17	1 54	11 5	2 16	11 3	8 34	20 7	8 56	20 1	5 24	14 0	5 47	13 1		
M.	29	4 7	2 39	11 1	3 1	10 10	9 19	19 7	9 41	19 1	6 10	13 4	6 34	13 1		
Tu.	30	4 54	3 23	10 8	3 44	10 6	10 3	18 7	10 26	18 1	6 58	12 7	7 22	13 1		
W.	31	5 38	4 6	10 3	4 29	10 2	10 52	17 8	11 20	17 3	7 47	11 11	8 12	11 1		
Half Mean Spring Range.			5 ft. 9 in.				10 ft. 5 in.				7 ft. 2 in.					
Phases of the Moon.							Moon's Declination at Noon.									
							M.D.	°	'	M.D.	°	'	M.D.	°		
First Quarter							2	4	4	Afternoon.	1	15	N. 29	9	12	S. 27
Full							10	8	23	Afternoon.	17	11	S. 6	25	18	N. 4
Last Quarter							18	6	39	Morning.	18	7	7	26	19	
New							24	10	49	Afternoon.	19	2	39	27	18	
							2	5	50		20	2	N. 1	28	16	
							5	2	2		21	6	39	29	13	
In Apogee							6	4	0	Afternoon.	22	10	56	30	10	
In Perigee							22	0	0	Noon.	23	14	32	31	7	
							7	5	36		24	17	12			
							8	9	12		16	14	26			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 3 m.

MAY, 1865.

NORTH SHIELDS.								LEITH.								THURSO.								C's AGE AT NOON.		
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.						
Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.				
H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.		D.	
1	7	21	11	4	7	50	10	10	6	18	14	2	6	45	13	7	0	9	11	0	0	37	10	6	5.9	
2	8	21	10	4	8	54	10	0	7	16	13	2	7	48	12	9	1	7	10	1	1	39	9	9	6	
3	9	30	9	9	10	8	9	9	8	23	12	6	9	0	12	4	2	14	9	5	2	53	9	4	7.9	
4	10	44	9	9	11	17	9	11	9	38	12	4	10	11	12	6	3	35	9	3	4	10	9	3	8.9	
5	11	49	10	1	—	—	—	—	10	42	12	8	11	11	12	11	4	43	9	4	5	13	9	6	9.9	
6	0	18	10	4	0	43	10	6	11	37	13	2	—	—	—	5	39	9	10	6	5	10	2	10.9		
7	1	8	10	9	1	31	11	0	0	3	13	5	0	25	13	9	6	26	10	6	6	43	10	11	11.9	
8	1	49	11	3	2	7	11	7	0	43	14	1	1	1	14	5	6	59	11	4	7	14	11	8	12.9	
9	2	25	11	10	2	41	12	1	1	20	14	9	1	37	15	0	7	29	12	0	7	45	12	3	13.9	
10	2	58	12	3	3	15	12	5	1	55	15	3	2	13	15	6	8	1	12	6	8	18	12	7	14.9	
11	3	32	12	7	3	49	12	8	2	30	15	8	2	46	15	8	8	34	12	11	8	50	12	7	15.9	
12	4	5	12	8	4	22	12	7	3	2	15	8	3	18	15	7	9	7	12	7	9	25	12	6	16.9	
13	4	40	12	6	4	59	12	4	3	36	15	6	3	54	15	4	9	44	12	4	10	3	12	2	17.9	
14	5	18	12	3	5	38	12	1	4	12	15	2	4	33	15	1	10	23	12	0	10	45	11	9	18.9	
15	6	0	11	11	6	22	11	9	4	54	14	11	5	16	14	8	11	8	11	6	11	32	11	3	19.9	
16	6	44	11	7	7	9	11	5	5	40	14	5	6	6	14	2	11	58	11	0	—	—	—	—	—	20.9
17	7	37	11	2	8	9	10	10	6	33	13	11	7	4	13	8	0	25	10	9	0	56	10	6	21.9	
18	8	44	10	8	9	21	10	7	7	39	13	6	8	15	13	4	1	29	10	5	2	6	10	4	22.9	
19	10	0	10	7	10	35	10	9	8	52	13	4	9	30	13	6	2	44	10	3	3	25	10	4	23.9	
20	11	8	11	0	11	41	11	4	10	3	13	8	10	34	14	0	4	1	10	6	4	35	10	8	24.9	
21	—	—	—	—	0	11	11	11	11	4	14	4	11	33	14	8	5	6	11	0	5	34	11	4	25.9	
22	0	38	11	11	1	4	12	3	11	59	15	0	—	—	—	6	0	11	9	6	26	12	3	26.9		
23	1	31	12	6	1	58	12	10	0	25	15	6	0	52	15	11	6	49	12	9	7	11	13	2	27.9	
24	2	23	13	2	2	46	13	5	1	18	16	3	1	43	16	7	7	33	13	6	7	56	13	9	28.9	
25	3	9	13	7	3	33	13	8	2	7	16	9	2	31	16	10	8	19	13	10	8	42	13	9	29.9	
26	3	57	13	8	4	20	13	7	2	54	16	9	3	16	16	8	9	5	13	7	9	27	13	5	30.9	
27	4	42	13	4	5	4	13	1	3	38	16	5	4	0	16	1	9	49	13	1	10	12	12	9	31.9	
28	5	27	12	9	5	51	12	6	4	23	15	9	4	46	15	6	10	36	12	5	10	59	12	0	3.5	
29	6	14	12	2	6	36	11	10	5	9	15	2	5	32	14	9	11	23	11	7	11	47	11	2	4.5	
30	6	59	11	7	7	23	11	2	5	55	14	5	6	20	14	0	—	—	—	0	11	10	10	—	5.5	
31	7	50	10	10	8	18	10	5	6	46	13	7	7	12	13	3	0	38	10	6	1	5	10	2	6.5	
at Mean Spring } 6ft. 8in. Range.								8ft. 2in.								6ft. 7in.										

At Mean Spring } 6ft. 8in.
Range.

8ft. 2in.

6ft. 7in.

Equation of Time at Noon.

M. S.	Add.	N.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
3 3		9	3 45		17	3 51		25	3 20	
3 10		10	3 48		18	3 49		26	3 14	
3 17		11	3 50		19	3 47		27	3 8	
3 23		12	3 52		20	3 44		28	3 0	
3 28		13	3 53		21	3 40		29	2 53	
3 33		14	3 53		22	3 36		30	2 45	
3 38		15	3 53		23	3 31		31	2 36	
3 42		16	3 52		24	3 26				

Use of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 NORTH SHIELDS add 0 m. LEITH add 12 m. THURSO add 14 m.

MAY, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
M.	1	5 27	3 40	9 1	4 6	8 11	2 51	22 9	3 16	21 11	10 4	17 6	10 28	16 1	
Tu.	2	6 15	4 32	8 8	4 59	8 6	3 43	21 2	4 13	20 6	10 52	16 2	11 17	15 2	
W.	3	6 59	5 29	8 4	6 3	8 3	4 47	19 11	5 24	19 9	11 47	15 4	—	—	
Th.	4	7 42	6 39	8 2	7 13	8 1	6 5	19 9	6 42	19 11	0 20	15 3	0 55	15 3	
F.	5	8 25	7 46	8 2	8 19	8 4	7 16	20 3	7 47	20 9	1 32	15 5	2 8	15 5	
S.	6	9 7	8 46	8 5	9 15	8 7	8 14	21 2	8 41	21 9	2 38	16 3	3 10	16 3	
S.	7	9 49	9 41	8 8	10 2	8 10	9 4	22 3	9 23	22 9	3 37	17 4	4 0	17 4	
M.	8	10 33	10 21	8 11	10 41	9 0	9 41	23 3	9 59	23 8	4 22	18 3	4 43	18 3	
Tu.	9	11 18	11 0	9 1	11 20	9 2	10 16	23 11	10 34	24 3	5 3	19 0	5 24	19 0	
W.	10	morn.	11 39	9 3	11 58	9 4	10 52	24 6	11 10	24 8	5 44	19 7	6 2	19 7	
Th.	11	0 5	—	—	0 16	9 4	11 28	24 10	11 45	24 10	6 19	19 11	6 36	20 0	
F.	12	0 55	0 33	9 5	0 51	9 5	—	—	0 3	24 11	6 53	20 2	7 11	20 2	
S.	13	1 46	1 10	9 5	1 28	9 5	0 21	24 11	0 39	24 10	7 29	19 11	7 47	19 11	
S.	14	2 38	1 46	9 5	2 5	9 5	0 57	24 7	1 16	24 4	8 6	19 6	8 27	19 6	
M.	15	3 30	2 26	9 4	2 47	9 3	1 36	24 0	1 57	23 7	8 49	19 0	9 10	18 0	
Tu.	16	4 23	3 8	9 2	3 30	9 1	2 18	23 2	2 40	22 10	9 31	18 3	9 54	18 3	
W.	17	5 15	3 54	9 0	4 22	8 11	3 5	22 6	3 33	22 0	10 19	17 7	10 45	17 7	
Th.	18	6 7	4 51	8 10	5 23	8 9	4 5	21 8	4 39	21 5	11 12	16 11	11 41	16 11	
F.	19	6 58	5 56	8 8	6 30	8 8	5 16	21 4	5 55	21 6	—	—	0 12	16 0	
S.	20	7 50	7 4	8 8	7 38	8 10	6 33	21 11	7 8	22 5	0 46	17 0	1 24	17 0	
S.	21	8 43	8 11	9 0	8 43	9 2	7 40	23 1	8 10	23 8	2 3	17 11	2 37	18 0	
M.	22	9 38	9 14	9 3	9 44	9 5	8 38	24 4	9 5	25 0	3 9	19 2	3 42	19 2	
Tu.	23	10 34	10 13	9 7	10 40	9 8	9 32	25 6	9 57	26 0	4 13	20 4	4 43	20 4	
W.	24	11 32	11 7	9 9	11 33	9 10	10 21	26 4	10 46	26 6	5 11	21 2	5 38	21 2	
Th.	25	0 23	12 0	9 10	—	—	11 11	26 8	11 36	26 8	6 4	21 7	6 28	21 7	
F.	26	1 29	0 25	9 11	0 49	9 11	12 0	26 7	—	—	6 51	21 6	7 13	21 6	
S.	27	2 24	1 12	9 10	1 34	9 9	0 22	26 4	0 44	26 1	7 34	21 0	7 56	20 0	
S.	28	3 17	1 56	9 8	2 17	9 7	1 6	25 7	1 28	25 0	8 19	20 2	8 41	20 2	
M.	29	4 7	2 39	9 5	3 1	9 3	1 49	24 5	2 11	23 9	9 3	19 1	9 23	18 0	
Tu.	30	4 54	3 21	9 2	3 43	9 0	2 32	23 1	2 54	22 6	9 43	18 0	10 4	17 0	
W.	31	5 38	4 6	8 10	4 29	8 9	3 17	21 11	3 40	21 4	10 26	17 0	10 47	16 0	
Half Mean Spring Range.			4 ft. 10 in.				13 ft. 0 in.				10 ft. 6 in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	0	1	M.D.	0	1	M.D.	0	1
First Quarter - 2 4 4 Afternoon.							1	15 N. 29	9	12 S. 27	17	11 S. 6	25	18 N. 4	
Full - - - - - 10 8 23 Afternoon.							2	12 42	10	15 13	18	7 7	26	19	
Last Quarter - 18 6 39 Morning.							3	9 26	11	17 21	19	2 39	27	18	
New - - - - - 24 10 49 Afternoon.							4	5 50	12	18 40	20	2 N. 1	28	16	
							5	2 2	13	19 5	21	6 39	29	13	
In Apogee - - 6 4 0 Afternoon.							6	1 S. 49	14	18 30	22	10 56	30	10	
In Perigee - - 22 0 0 Morning.							7	5 36	15	16 56	23	14 32	31	7	
							8	9 12	16	14 26	24	17 12			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,
 GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROKE add 22 m.

MAY, 1865.

ESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's Age at Noon.
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	
32 31 11	10	55 30 9	1	51 14 0	2	18 13 7	2	50 9 8	3	17 9 5	5'9	
20 29 8	11	49 28 10	2	48 13 2	3	20 12 8	3	46 9 3	4	18 9 0	9	
—	—	0 23 28 4	3	55 12 6	4	33 12 5	4	53 8 10	5	27 8 9	7'9	
58 28 2	1	33 28 3	5	12 12 5	5	45 12 6	6	0 8 9	6	32 8 10	8'9	
8 28 6	2	41 29 1	6	16 12 9	6	45 13 0	7	3 9 0	7	32 9 2	9'9	
12 29 8	3	44 30 4	7	11 13 3	7	37 13 6	7	59 9 3	8	27 9 5	10'9	
14 31 1	4	39 31 11	8	0 13 9	8	19 14 1	8	53 9 7	9	15 9 9	11'9	
2 32 9	5	24 33 5	8	37 14 4	8	54 14 7	9	35 9 11	9	54 10 1	12'9	
44 34 0	6	5 34 6	9	11 14 9	9	28 15 0	10	10 10 3	10	26 10 4	13'9	
25 34 11	6	44 35 2	9	46 15 2	10	3 15 3	10	43 10 6	11	0 10 7	14'9	
3 35 5	7	20 35 7	10	19 15 4	10	34 15 4	11	17 10 7	11	33 10 7	15'9	
37 35 9	7	55 35 8	10	50 15 4	11	7 15 3	11	50 11 7	—	—	16'9	
12 35 7	8	29 35 5	11	24 15 2	11	43 15 1	0	9 10 6	0	28 10 5	17'9	
47 35 2	9	6 34 10	—	—	0	4 14 11	0	47 10 4	1	7 10 3	18'9	
25 34 5	9	45 33 10	0	26 14 9	0	50 14 6	1	29 10 1	1	51 10 0	19'9	
4 33 3	10	24 32 8	1	14 14 3	1	39 14 0	2	14 9 10	2	39 9 9	20'9	
47 32 0	11	13 31 5	2	6 13 10	2	37 13 7	3	5 9 7	3	35 9 6	21'9	
43 30 11	—	—	3	10 13 5	3	47 13 4	4	9 9 4	4	45 9 3	22'9	
16 30 8	0	49 30 9	4	25 13 4	5	3 13 6	5	20 9 3	5	53 9 4	23'9	
24 31 1	1	59 31 8	5	36 13 9	6	8 14 1	6	24 9 6	6	55 9 8	24'9	
35 32 6	3	11 33 3	6	38 14 5	7	6 14 8	7	25 9 11	7	55 10 1	25'9	
46 34 2	4	20 35 2	7	34 15 1	8	1 15 5	8	25 10 4	8	57 10 6	26'9	
54 36 1	5	24 36 10	8	28 15 9	8	52 16 0	9	27 10 8	9	52 10 10	27'9	
52 37 3	6	20 37 10	9	16 16 3	9	40 16 5	10	15 11 0	10	38 11 2	28'9	
46 38 0	7	11 38 2	10	4 16 5	10	27 16 5	11	1 11 3	11	25 11 3	29'9	
34 38 2	7	56 37 10	10	48 16 4	11	8 16 2	11	48 11 2	—	—	30'9	
17 37 4	8	38 36 10	11	29 15 11	11	53 15 8	0	11 11 0	0	34 10 10	31'9	
59 36 3	9	19 35 6	—	—	0	17 15 4	0	57 10 8	1	20 10 5	32'9	
39 34 8	9	57 33 9	0	41 15 0	1	5 14 7	1	43 10 3	2	6 10 0	33'9	
15 32 10	10	34 31 11	1	29 14 3	1	53 13 10	2	29 9 10	2	53 9 7	34'9	
53 31 0	11	15 30 2	2	19 13 7	2	45 13 3	3	18 9 5	3	44 9 3	35'9	
a Spring } 18ft. 7in. go.				8ft. 0in.				5ft. 6in.				

Spring } 18 ft. 7 in.
neap }

8 ft. 0 in.

5 ft. 6 in.

Equation of Time at Noon.

L. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
3		9	3 45		17	3 51		25	3 20	
10		10	3 48		18	3 49		26	3 14	
17		11	3 50		19	3 47		27	3 8	
23		12	3 52		20	3 44		28	3 0	
28		13	3 53		21	3 40		29	2 53	
33		14	3 53		22	3 36		30	2 45	
38		15	3 53		23	3 31		31	2 36	
42		16	3 52		24	3 26				

High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 ESTON-SUPER-MARE add 15 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

MAY, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
M.	1	5 27	2 33	8 9	3 1	8 6	—	—	0 10	6 0	9 23	8 11	9 55	8 0
Tu.	2	6 15	3 30	8 4	4 0	8 2	0 47	5 9	1 24	5 7	10 29	8 5	11 5	8 0
W.	3	6 59	4 34	8 1	5 8	8 0	2 7	5 6	2 45	5 6	11 41	8 2	—	—
Th.	4	7 42	5 42	8 0	6 15	8 0	3 20	5 8	3 50	5 10	0 16	8 2	0 49	8 0
F.	5	8 25	6 48	8 0	7 19	8 1	4 18	6 0	4 42	6 2	1 21	8 4	1 51	8 0
S.	6	9 7	7 45	8 2	8 11	8 4	5 2	6 4	5 25	6 5	2 17	8 9	2 43	9 0
A.	7	9 49	8 34	8 6	8 53	8 8	5 45	6 7	6 3	6 8	3 5	9 3	3 23	9 0
M.	8	10 33	9 11	8 10	9 29	8 11	6 21	6 10	6 40	7 0	3 40	9 9	3 56	10 0
Tu.	9	11 18	9 46	9 0	10 4	9 1	6 58	7 1	7 17	7 2	4 13	10 3	4 30	10 0
W.	10	morn.	10 22	9 2	10 39	9 3	7 36	7 3	7 53	7 3	4 48	10 7	5 7	10 0
Th.	11	0 5	10 56	9 3	11 12	9 2	8 9	7 4	8 25	7 4	5 25	10 9	5 42	10 0
F.	12	0 55	11 28	9 2	11 45	9 2	8 40	7 4	8 57	7 3	5 58	10 9	6 15	10 0
S.	13	1 46	—	—	0 3	9 2	9 13	7 2	9 30	7 1	6 33	10 7	6 51	10 0
A.	14	2 38	0 22	9 1	0 43	9 1	9 48	6 11	10 8	6 10	7 11	10 2	7 32	10 0
M.	15	3 30	1 5	9 0	1 29	8 11	10 30	6 8	10 52	6 6	7 53	9 9	8 15	9 0
Tu.	16	4 23	1 54	8 10	2 20	8 9	11 21	6 4	11 53	6 2	8 40	9 4	9 8	9 0
W.	17	5 15	2 48	8 8	3 19	8 7	—	—	0 32	6 0	9 42	9 0	10 18	8 0
Th.	18	6 7	3 52	8 6	4 26	8 5	1 12	5 11	1 55	5 11	10 56	8 10	11 33	8 0
F.	19	6 58	5 1	8 5	5 34	8 5	2 37	6 0	3 12	6 3	—	—	0 7	9 0
S.	20	7 50	6 7	8 5	6 40	8 6	3 42	6 6	4 10	6 9	0 40	9 2	1 13	9 0
A.	21	8 43	7 12	8 7	7 41	8 9	4 35	7 0	4 57	7 1	1 44	9 7	2 13	9 10
M.	22	9 38	8 8	8 11	8 35	9 2	5 19	7 3	5 45	7 5	2 39	10 2	3 5	10 0
Tu.	23	10 34	9 3	9 4	9 28	9 6	6 12	7 7	6 39	7 9	3 30	10 10	3 54	11 0
W.	24	11 32	9 52	9 7	10 16	9 7	7 5	7 10	7 30	7 11	4 18	11 4	4 43	11 0
Th.	25	on 31	10 40	9 8	11 3	9 7	7 54	8 0	8 17	8 0	5 8	11 7	5 33	11 0
F.	26	1 29	11 26	9 7	11 46	9 6	8 38	7 11	8 58	7 9	5 56	11 6	6 17	11 0
S.	27	2 24	—	—	0 9	9 5	9 18	7 7	9 39	7 4	6 38	11 1	7 1	10 10
A.	28	3 17	0 33	9 4	0 56	9 3	10 0	7 2	10 22	6 11	7 24	10 5	7 46	10 1
M.	29	4 7	1 19	9 1	1 44	9 0	10 44	6 9	11 8	6 6	8 8	9 9	8 30	9 0
Tu.	30	4 54	2 9	8 10	2 35	8 8	11 37	6 3	—	—	8 54	9 2	9 22	8 10
W.	31	5 38	3 1	8 6	3 27	8 4	0 9	6 0	0 42	5 9	9 51	8 8	10 21	8 0
Half Mean Spring Range.			4 ^{ft.} 9 ^{in.}				3 ^{ft.} 10 ^{in.}				5 ^{ft.} 7 ^{in.}			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D. ° ' M.D. ° ' M.D. ° ' M.D. ° '							
First Quarter - 2 4 4 Afternoon.							1 15 N. 39 9 12 S. 27 17 11 S. 6 25 18 N. 4							
Full - - - - 10 8 23 Afternoon.							2 12 42 10 15 13 18 7 7 26 19							
Last Quarter - 18 6 39 Morning.							3 9 26 11 17 21 19 2 39 27 18 1							
New - - - - 24 10 49 Afternoon.							4 5 50 12 18 40 20 2 N. 1 28 16 2							
							5 2 2 13 19 5 21 6 39 29 13 5							
In Apogee - - 6 4 0 Afternoon.							6 1 S. 49 14 18 30 22 10 56 30 10 4							
In Perigee - - 22 0 0 Noon.							7 5 36 15 16 56 23 14 32 31 7							
							8 9 12 16 14 26 24 17 12							

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required, —
 BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 8 m.

MAY, 1865.

GALWAY.					QUEENSTOWN.					WATERFORD.					C's AGE AT NOON.
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			
Time.	Height.	Time.	Height		Time.	Height.	Time.	Height.		Time.	Height.	Time.	Height.		
H. M. F. I.		H. M. F. I.			H. M. F. I.		H. M. F. I.			H. M. F. I.		H. M. F. I.		D.	
8 42 12 0		9 10 11 5			8 55 10 0		9 20 9 8			9 11 11 0		9 34 10 8		5.9	
9 39 11 0		10 13 10 9			9 45 9 4		10 13 9 1			10 2 10 4		10 36 10 0		6.9	
10 49 10 8		11 27 10 7			10 48 9 0		11 24 8 11			11 9 9 10		11 42 9 8		7.9	
— —		0 1 10 9			11 59 9 0		— —			— —		0 13 9 8		8.9	
0 33 10 11		1 3 11 2			0 32 9 1		1 5 9 3			0 44 9 10		1 15 10 0		9.9	
1 29 11 6		1 54 11 10			1 35 9 5		2 6 9 8			1 44 10 2		2 15 10 5		10.9	
2 17 12 2		2 37 12 5			2 33 9 10		2 54 10 1			2 44 10 8		3 9 10 11		11.9	
2 57 12 9		3 16 13 0			3 15 10 4		3 35 10 7			3 31 11 1		3 53 11 4		12.9	
3 32 13 3		3 50 13 6			3 54 10 9		4 13 10 11			4 14 11 6		4 35 11 8		13.9	
4 8 13 9		4 26 13 11			4 32 11 1		4 50 11 2			4 55 11 9		5 13 11 10		14.9	
4 42 14 0		4 59 14 1			5 8 11 3		5 26 11 3			5 30 11 10		5 46 11 11		15.9	
5 17 14 1		5 36 14 1			5 44 11 3		6 3 11 3			6 4 11 11		6 23 11 11		16.8	
5 54 14 0		6 12 13 10			6 20 11 3		6 38 11 2			6 41 11 11		7 0 11 11		17.9	
6 32 13 8		6 54 13 6			6 58 11 0		7 19 10 11			7 19 11 10		7 39 11 9		18.9	
7 16 13 3		7 39 13 0			7 40 10 9		8 0 10 7			7 59 11 8		8 19 11 6		19.9	
8 4 12 8		8 30 12 4			8 21 10 5		8 44 10 2			8 40 11 4		9 1 11 2		20.9	
9 0 12 0		9 31 11 9			9 11 10 0		9 38 9 10			9 25 11 0		9 54 10 10		21.9	
10 5 11 8		10 41 11 8			10 7 9 9		10 40 9 8			10 28 10 8		11 2 10 7		22.9	
11 18 11 10		11 52 12 1			11 15 9 9		11 50 9 10			11 34 10 6		— —		23.9	
— —		0 25 12 4			— —		0 25 10 1			0 5 10 7		0 36 10 10		24.9	
0 56 12 9		1 24 13 2			0 59 10 4		1 33 10 7			1 8 11 0		1 41 11 3		25.9	
1 51 13 7		2 19 13 11			2 5 10 10		2 36 11 1			2 15 11 7		2 50 11 11		26.9	
2 48 14 3		3 14 14 7			3 7 11 4		3 34 11 7			3 23 12 2		3 53 12 4		27.9	
3 38 14 10		4 3 15 1			4 1 11 10		4 27 12 0			4 22 12 7		4 49 12 8		28.9	
4 27 15 3		4 51 15 3			4 52 12 1		5 17 12 1			5 15 12 8		5 39 12 8		29.5	
5 14 15 3		5 37 15 1			5 42 12 0		6 4 11 11			6 2 12 8		6 24 12 7		30.5	
5 59 14 10		6 22 14 6			6 26 11 9		6 48 11 7			6 46 12 6		7 9 12 4		31.5	
6 45 14 2		7 8 13 9			7 10 11 4		7 32 11 1			7 31 12 2		7 52 12 0		32.5	
7 31 13 4		7 54 12 11			7 54 10 9		8 14 10 6			8 13 11 9		8 32 11 6		33.5	
8 18 12 5		8 42 12 0			8 34 10 3		8 56 10 0			8 51 11 3		9 12 11 0		34.5	
9 7 11 6		9 33 11 3			9 18 9 9		9 40 9 6			9 32 10 9		9 57 10 6		35.5	

Mean Spring } 7ft. 5in.
Range.

5ft. 10in.

6ft. 2in.

Equation of Time at Noon.

M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.
3 3		9	3 45		17	3 51		25	3 20	
3 10		10	3 48		18	3 49		26	3 14	
3 17		11	3 50		19	3 47		27	3 8	
3 23		12	3 52		20	3 44		28	3 0	
3 28		13	3 53		21	3 40		29	2 53	
3 33		14	3 53		22	3 36		30	2 45	
3 38		15	3 53		23	3 31		31	2 36	
3 42		16	3 52		24	3 26				

es of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.

JUNE, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRAMIT.	BREST.								DEVONPORT.								PORTSMOUTH.																														
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTER.																										
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																													
Th.	1	6 21	8 58	14 0	9 25	13 10	10 26	11 11	10 52	12 3	4 30	10 6	4 54																																				
F.	2	7 3	9 59	13 9	10 32	13 9	11 22	11 8	11 57	11 9	5 21	10 1	5 52																																				
S.	3	7 45	11 4	13 10	11 37	14 0	—	—	0 32	11 11	6 22	9 11	6 53																																				
●.	4	8 28	—	—	0 8	14 3	1 6	12 5	1 40	12 5	7 24	10 2	7 55																																				
M.	5	9 13	0 36	14 7	1 24	14 11	2 14	12 9	2 42	12 11	8 26	10 7	8 53																																				
Tu.	6	10 0	1 27	15 4	1 49	15 10	3 8	13 3	3 34	13 7	9 19	11 0	9 43																																				
W.	7	10 48	2 10	16 4	2 30	16 9	3 58	13 9	4 22	14 10	5 11	5 10	10 26																																				
Th.	8	11 39	2 51	17 2	3 11	17 6	4 43	14 3	5 4	14 8	10 47	11 9	11 7																																				
F.	9	morn.	3 30	17 9	3 49	17 11	5 24	14 8	5 43	15 11	11 26	11 11	11 45																																				
S.	10	0 32	4 9	18 1	4 30	18 2	6 2	14 10	6 22	15 4	—	—	0 5																																				
●.	11	1 25	4 47	18 3	5 6	18 3	6 42	14 11	7 0	15 5	0 26	12 2	0 46																																				
M.	12	2 19	5 26	18 3	5 46	18 2	7 18	14 10	7 37	15 4	1 6	12 2	1 27																																				
Tu.	13	3 12	6 9	18 0	6 32	17 9	7 57	14 7	8 19	15 0	1 48	12 2	2 10																																				
W.	14	4 4	6 56	17 5	7 21	17 0	8 40	14 2	9 2	14 7	2 33	12 0	2 57																																				
Th.	15	4 55	7 48	16 7	8 15	16 2	9 24	13 9	9 50	14 0	3 21	11 9	3 46																																				
F.	16	5 47	8 43	15 10	9 12	15 8	10 17	13 3	10 47	13 7	4 13	11 5	4 41																																				
■.	17	6 38	9 45	15 6	10 19	15 6	11 19	13 0	11 54	13 4	5 9	11 1	5 39																																				
■.	18	7 31	10 54	15 7	11 31	15 ■	—	—	0 32	13 2	6 11	10 11	6 43																																				
M.	19	8 25	—	—	0 8	16 1	1 11	13 6	1 49	13 7	7 18	11 0	7 56																																				
Tu.	20	9 20	0 39	16 5	1 10	16 10	2 27	13 10	2 59	14 2	8 30	11 6	9 2																																				
W.	21	10 17	1 40	17 4	2 8	17 9	3 30	14 5	3 59	14 9	9 34	12 0	10 3																																				
Th.	22	11 15	2 35	18 3	3 0	18 7	4 26	14 11	4 53	15 4	10 31	12 4	10 57																																				
F.	23	0 11	3 25	18 9	3 48	18 10	5 19	15 3	5 43	15 8	11 22	12 6	11 44																																				
S.	24	1 5	4 11	18 10	4 33	18 9	6 6	15 3	6 28	15 10	—	—	0 7																																				
●.	25	1 57	4 52	18 8	5 12	18 6	6 48	15 3	7 6	15 8	0 30	12 6	0 52																																				
M.	26	2 46	5 32	18 3	5 52	17 11	7 24	14 11	7 42	15 4	1 12	12 3	1 33																																				
Tu.	27	3 32	6 12	17 7	6 32	17 3	8 1	14 4	8 19	14 8	1 54	12 1	2 13																																				
W.	28	4 16	6 51	16 9	7 10	16 3	8 35	13 9	8 50	13 11	2 33	11 9	2 52																																				
Th.	29	4 59	7 31	15 9	7 53	15 3	9 6	13 1	9 25	13 3	3 11	11 5	3 31																																				
F.	30	5 41	8 14	14 9	8 37	14 4	9 45	12 5	10 5	12 6	3 51	11 0	4 11																																				
Half Mean Spring Range.			9ft. 6in.								7ft. 9in.								6ft. 4in.																														
Phases of the Moon.																									Moon's Declination at Noon.																								
D. H. M.																									M.D. ° ' M.D. ° ' M.D. ° ' M.D.																								
First Quarter- 1 8 22 Morning.																									1 3 N.20 9 19 S. 6 17 5 N.18 25 1																								
Full - - - - 9 9 41 Morning.																									2 0 S.31 10 18 50 18 9 36 26 1																								
Last Quarter - 16 11 53 Morning.																									3 4 22 11 17 32 19 13 22 27																								
New - - - - 23 7 57 Morning.																									4 8 3 12 15 14 20 16 20 28																								
																									5 11 26 13 12 4 21 18 17 29																								
In Apogee - - 3 9 0 Morning.																									6 14 24 14 8 13 22 19 6 30																								
In Perigee - - 18 4 0 Afternoon.																									7 16 46 15 3 52 23 18 46																								
																									8 18 23 16 0 N.43 24 17 21																								

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 Brest add 18 m. 1 Devonport add 11 m. 1 Portsmouth add 4 m.

JUNE, 1865.

DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	
4 10 15 3		4 32 14 11		5 40 13 8		6 7 13 5		7 9 16 8		7 34 16 5		D
4 57 14 7		5 24 14 5		6 36 13 2		7 7 13 0		8 2 16 2		8 34 16 0		8.5
5 52 14 4		6 20 14 6		7 41 13 1		8 14 13 2		9 8 15 11		9 40 15 10		9.5
6 50 14 8		7 22 15 0		8 45 13 3		9 15 13 5		10 10 15 11		10 41 16 0		10.5
7 51 15 3		8 18 15 7		9 45 13 8		10 12 13 11		11 12 16 1		11 41 16 4		11.5
8 42 15 10		9 6 16 2		10 37 14 1		11 1 14 4		— — — —		0 7 16 6		12.5
9 29 16 6		9 51 16 10		11 23 14 6		11 44 14 9		0 32 16 9		0 52 17 0		13.5
10 13 17 1		10 35 17 4		— — — —		0 4 15 0		1 12 17 3		1 34 17 6		14.5
10 55 17 6		11 17 17 8		0 24 15 2		0 44 15 3		1 54 17 9		2 13 18 0		15.5
11 38 17 10		12 0 17 11		1 3 15 5		1 22 15 6		2 33 18 2		2 53 18 4		16.5
— — — —		0 20 18 0		1 41 15 7		2 0 15 7		3 10 18 6		3 30 18 7		17.5
0 41 18 1		1 3 18 1		2 18 15 7		2 37 15 7		3 49 18 8		4 8 18 9		18.5
1 26 18 1		1 50 18 0		2 56 15 7		3 16 15 6		4 27 18 9		4 48 18 8		19.5
2 14 17 10		2 38 17 8		3 39 15 4		4 2 15 2		5 10 18 7		5 34 18 5		20.5
3 2 17 4		3 28 17 1		4 26 15 0		4 51 14 9		5 57 18 3		6 22 18 0		21.5
3 54 16 10		4 21 16 6		5 19 14 7		5 47 14 5		6 48 17 9		7 16 17 7		22.5
4 47 16 2		5 14 15 11		6 18 14 3		6 50 14 1		7 47 17 5		8 19 17 2		23.5
5 42 15 10		6 10 15 11		7 25 14 0		8 1 14 1		8 54 17 1		9 30 17 0		24.5
6 44 16 1		7 22 16 5		8 35 14 3		9 10 14 5		10 3 17 0		10 36 17 1		25.5
7 55 16 9		8 26 17 1		9 44 14 8		10 15 14 11		11 11 17 3		11 43 17 5		26.5
8 57 17 5		9 26 17 9		10 45 15 2		11 14 15 4		— — — —		0 14 17 8		27.5
9 55 18 0		10 23 18 2		11 41 15 7		— — — —		0 42 17 11		1 10 18 2		28.5
10 50 18 4		11 16 18 5		0 8 15 9		0 33 15 11		1 37 18 5		2 1 18 8		29.5
11 40 18 5		— — — —		0 58 16 0		1 21 16 0		2 27 18 10		2 51 18 11		30.5
0 4 18 5		0 26 18 4		1 43 16 0		2 4 15 11		3 12 19 0		3 35 19 0		31.5
0 48 18 3		1 10 18 1		2 24 15 10		2 43 15 9		3 55 18 11		4 15 18 10		32.5
1 32 17 11		1 53 17 8		3 2 15 7		3 22 15 4		4 35 18 8		4 53 18 6		33.5
2 13 17 5		2 33 17 1		3 42 15 2		4 2 14 11		5 13 18 4		5 33 18 1		34.5
2 53 16 9		3 12 16 5		4 21 14 8		4 41 14 4		5 53 17 10		6 12 17 7		35.5
3 32 16 0		3 52 15 8		5 1 14 1		5 23 13 10		6 34 17 3		6 56 16 11		36.5
Mean Spring } 9ft. 4in.				8ft. 0in.				9ft. 7in.				
Range.												

Equation of Time at Noon.

M. S.		M.D.	M. S.		M.D.	M. S.		M.D.	M. S.	
2 28	Add.	9	1 5	Add.	17	0 34	Sub.	25	2 18	Sub.
2 18		10	0 53		18	0 47		26	2 31	
2 9		11	0 41		19	1 0		27	2 43	
1 59		12	0 29		20	1 13		28	2 56	
1 49		13	0 17		21	1 26		29	3 8	
1 38		14	0 4		22	1 39		30	3 20	
1 27		15	0 8	Sub.	23	1 52				
1 16		16	0 21		24	2 5				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. SHEERNESS subtract 3 m. LONDON 0 m.

JUNE, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.							
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.					
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.				
Th.	1	6a21	4 53	10 0	5 18	9 10	11 51	16 10	—	—	8 39	11 5	9 7	11 9				
F.	2	7 3	5 44	9 9	6 13	9 8	0 21	16 6	0 51	16 4	9 38	11 0	10 11	10 12				
S.	3	7 45	6 48	9 8	7 22	9 9	1 21	16 3	1 50	16 3	10 41	10 11	11 11	11 1				
●	4	8 28	7 53	9 10	8 23	9 11	2 18	16 6	2 46	16 9	11 39	11 3	—	—				
M.	5	9 13	8 52	10 1	9 19	10 2	3 14	17 2	3 41	17 6	0 6	11 6	0 31	11 9				
Tu.	6	10 0	9 45	10 4	10 10	10 6	4 6	17 10	4 30	18 3	0 56	12 0	1 20	12 3				
W.	7	10 48	10 34	10 8	10 55	10 10	4 52	18 6	5 12	18 10	1 44	12 6	2 7	12 1				
Th.	8	11 39	11 16	10 11	11 37	11 1	5 32	19 1	5 53	19 4	2 28	12 11	2 49	13 1				
F.	9	morn.	11 57	11 2	—	—	6 13	19 6	6 33	19 8	3 8	13 3	3 25	13 5				
S.	10	0 32	0 16	11 2	0 34	11 2	6 52	19 10	7 12	20 0	3 44	13 7	4 4	13 9				
●	11	1 25	0 53	11 3	1 14	11 3	7 33	20 1	7 52	20 2	4 23	13 11	4 41	13 11				
M.	12	2 19	1 33	11 2	1 52	11 2	8 10	20 2	8 30	20 2	5 0	13 10	5 21	13 9				
Tu.	13	3 12	2 13	11 1	2 34	11 0	8 51	20 0	9 15	19 9	5 43	13 7	6 6	13 3				
W.	14	4 4	2 57	10 11	3 21	10 10	9 38	19 6	10 2	19 3	6 30	13 3	6 56	13 1				
Th.	15	4 55	3 44	10 9	4 8	10 8	10 27	19 0	10 55	18 8	7 23	12 11	7 51	12 1				
F.	16	5 47	4 34	10 7	5 1	10 6	11 27	18 5	—	—	8 20	12 6	8 50	12 4				
S.	17	6 38	5 29	10 5	5 58	10 4	0 2	18 2	0 36	17 11	9 21	12 2	9 56	12 1				
●	18	7 31	6 31	10 4	7 8	10 5	1 9	17 10	1 39	17 10	10 30	12 1	11 2	12 1				
M.	19	8 25	7 43	10 6	8 18	10 7	2 8	18 0	2 40	18 4	11 33	12 4	—	—				
Tu.	20	9 20	8 52	10 9	9 22	10 11	3 13	18 9	3 44	19 2	0 4	12 7	0 34	12 11				
W.	21	10 17	9 53	11 1	10 25	11 2	4 14	19 6	4 43	19 10	1 4	13 2	1 35	13 3				
Th.	22	11 15	10 53	11 4	11 20	11 6	5 10	20 1	5 36	20 4	2 4	13 7	2 32	13 11				
F.	23	0 11	11 46	11 7	—	—	6 2	20 6	6 27	20 7	2 58	13 11	3 21	14 1				
S.	24	1 5	0 11	11 7	0 33	11 7	6 51	20 8	7 14	20 8	3 43	14 2	4 5	14 1				
●	25	1 57	0 55	11 6	1 17	11 5	7 37	20 7	7 57	20 6	4 27	14 3	4 47	14 1				
M.	26	2 46	1 38	11 4	1 58	11 3	8 17	20 4	8 37	20 2	5 7	14 0	5 27	13 1				
Tu.	27	3 32	2 19	11 1	2 40	10 11	8 57	19 10	9 18	19 5	5 48	13 6	6 9	13 1				
W.	28	4 16	3 0	10 10	3 20	10 8	9 38	19 1	9 57	18 9	6 30	12 11	6 51	12 1				
Th.	29	4 59	3 39	10 6	3 58	10 4	10 16	18 4	10 37	17 11	7 12	12 5	7 33	12 1				
F.	30	5 41	4 17	10 3	4 37	10 1	11 1	17 7	11 26	17 2	7 55	11 10	8 18	11 1				
Half Mean Spring } Range			5 ft. 9 in.				10 ft. 5 in.				7 ft. 2 in.							
Phases of the Moon.							Moon's Declination at Noon.											
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'			
First Quarter -							1	3	N.20	9	19	8. 6	17	5	N.18			
Full - - - - -							9	9	B.32	10	18	50	18	9	36			
Last Quarter -							16	11	53	11	17	32	19	13	22			
New - - - - -							23	7	57	12	15	14	20	16	20			
							5	11	26	13	12	4	21	18	17			
In Apogee - -							3	9	0	14	24	14	8	13	22	19	6	
In Perigee - -							18	4	0	7	16	46	15	3	52	23	18	46
										8	18	23	16	0	N.43	24	17	21

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required—

HARWICH subtract 5 m.

HULL add 1 m.

SUNDERLAND add 5 m.

JUNE, 1865.

NORTH SHIELDS.						LEITH.						THURSO.						6 th AGE AT NOON.
MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			
Time. H. M. F. I.	Height. F. I.		Time. H. M. F. I.	Height. F. I.		Time. H. M. F. I.	Height. F. I.		Time. H. M. F. I.	Height. F. I.		Time. H. M. F. I.	Height. F. I.		Time. H. M. F. I.	Height. F. I.		
8 47	10 2		9 17	10 0		7 41	13 0		8 11	12 9		1 32	9 11		2 2	9 8		
9 51	9 11		10 23	9 11		8 43	12 7		9 17	12 6		2 35	9 6		3 10	9 5	8.5	
10 53	9 11		11 23	10 1		9 48	12 7		10 17	12 8		3 45	9 5		4 16	9 6	9.5	
11 52	10 3		—	—		10 45	12 10		11 13	13 0		4 46	9 7		5 15	9 8	10.5	
0 20	10 5		0 45	10 8		11 38	13 3		—	—		5 40	9 11		6 4	10 2	11.5	
1 8	10 10		1 30	11 0		0 2	13 5		0 24	13 9		6 25	10 6		6 45	10 10	12.5	
1 51	11 3		2 11	11 6		0 45	14 0		1 6	14 5		7 3	11 3		7 20	11 7	13.5	
2 30	11 9		2 49	12 0		1 26	14 9		1 47	15 0		7 37	11 11		7 55	12 3	14.5	
3 8	12 2		3 26	12 4		2 6	15 3		2 25	15 5		8 13	12 5		8 31	12 6	15.5	
3 45	12 6		4 4	12 7		2 43	15 7		3 1	15 8		8 49	12 7		9 8	12 8	16.5	
4 24	12 7		4 43	12 7		3 20	15 8		3 39	15 8		9 28	12 8		9 48	12 7	17.5	
5 3	12 7		5 24	12 6		3 58	15 7		4 19	15 6		10 9	12 6		10 31	12 4	18.5	
5 46	12 5		6 10	12 4		4 41	15 5		5 4	15 4		10 55	12 2		11 20	11 11	19.5	
6 34	12 2		6 58	12 0		5 28	15 2		5 54	14 11		11 46	11 9		—	—	20.5	
7 24	11 10		7 54	11 7		6 21	14 8		6 50	14 5		0 12	11 6		0 41	11 3	21.5	
8 25	11 4		8 58	11 1		7 19	14 2		7 52	14 0		1 11	11 1		1 43	10 11	22.5	
9 32	11 0		10 8	11 0		8 25	13 10		9 0	13 9		2 16	10 9		2 53	10 8	23.5	
10 42	11 0		11 14	11 2		9 35	13 9		10 7	13 11		3 31	10 8		4 6	10 8	24.5	
11 46	11 4		—	—		10 39	14 0		11 12	14 3		4 40	10 9		5 14	10 11	25.5	
0 19	11 7		0 47	11 9		11 41	14 6		—	—		5 43	11 2		6 10	11 6	26.5	
1 15	11 11		1 42	12 2		0 8	14 9		0 36	15 1		6 36	11 11		7 0	12 3	27.5	
2 9	12 5		2 35	12 8		1 3	15 5		1 31	15 9		7 23	12 8		7 45	12 11	28.5	
2 59	12 10		3 22	13 0		1 56	16 0		2 20	16 1		8 8	13 1		8 30	13 2	29.5	
3 44	13 1		4 6	13 1		2 42	16 2		3 3	16 2		8 51	13 1		9 12	13 0	30.5	
4 28	13 0		4 49	12 10		3 23	16 1		3 44	15 11		9 33	12 11		9 54	12 8	31.5	
5 9	12 8		5 30	12 6		4 4	15 8		4 25	15 6		10 15	12 6		10 37	12 2	32.5	
5 52	12 3		6 13	12 1		4 47	15 3		5 7	15 0		10 58	11 11		11 20	11 7	33.5	
6 33	11 10		6 53	11 7		5 28	14 9		5 48	14 6		11 41	11 4		—	—	34.5	
7 13	11 4		7 35	11 1		6 10	14 2		6 32	13 10		0 2	11 0		0 23	10 8	35.5	
7 59	10 9		8 24	10 5		6 54	13 6		7 18	13 3		0 46	10 5		1 10	10 2	36.5	
Mean Spring Range.			6ft. 8in.			8ft. 2in.			6ft. 7in.									

Equation of Time at Noon.

M. S.		M. D.	M. S.		M. D.	M. S.		M. D.	M. S.	
2 28	Add.	9	1 5	Add.	17	0 34	Sub.	25	2 18	Sub.
2 18		10	0 53		18	0 47		26	2 31	
2 9		11	0 41		19	1 0		27	2 43	
1 59		12	0 29		20	1 13		28	2 56	
1 49		13	0 17		21	1 26		29	3 8	
1 38		14	0 4		22	1 39		30	3 20	
1 27	Sub.	15	0 8		23	1 52				
1 16		16	0 21		24	2 5				

ms of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

JUNE, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.								
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.											
Th.	1	6h 21	4 54	8 7	5 19	8 6	4 7	20 10	4 35	20 4	11 9	16 0	11 33	15 1																	
F.	2	7 3	5 47	8 4	6 18	8 3	5 7	20 1	5 41	20 0	—	—	0 1	15 1																	
S.	3	7 45	6 48	8 2	7 19	8 2	6 15	20 1	6 48	20 3	0 30	15 6	1 2	15 1																	
●.	4	8 28	7 49	8 3	8 19	8 5	7 19	20 7	7 48	20 11	1 36	15 8	2 11	16 1																	
M.	5	9 13	8 48	8 6	9 15	8 7	8 16	21 4	8 40	21 9	2 41	16 5	3 9	16 1																	
Tu.	6	10 0	9 40	8 8	10 4	8 10	9 3	22 3	9 25	22 8	3 36	17 4	4 2	17 1																	
W.	7	10 48	10 26	8 11	10 48	9 0	9 46	23 1	10 4	23 6	4 26	18 2	4 50	18 1																	
Th.	8	11 39	11 10	9 1	11 31	9 2	10 25	23 10	10 45	24 1	5 14	18 11	5 36	19 1																	
F.	9	morn.	11 52	9 3	—	—	11 4	24 4	11 24	24 7	5 56	19 6	6 16	19 1																	
S.	10	0 32	0 12	9 3	0 32	9 4	11 44	24 10	—	—	6 36	20 0	6 56	20 1																	
●.	11	1 25	0 53	9 5	1 13	9 6	0 4	25 0	0 23	25 1	7 14	20 2	7 33	20 1																	
M.	12	2 19	1 32	9 6	1 52	9 6	0 43	25 1	1 3	25 1	7 53	20 1	8 14	20 1																	
Tu.	13	3 12	2 13	9 7	2 36	9 6	1 24	24 11	1 45	24 7	8 37	19 11	9 0	19 1																	
W.	14	4 4	2 59	9 5	3 21	9 4	2 8	24 4	2 31	24 0	9 23	19 4	9 46	19 1																	
Th.	15	4 55	3 44	9 4	4 10	9 3	2 54	23 8	3 21	23 3	10 10	18 8	10 34	18 1																	
F.	16	5 47	4 37	9 2	5 5	9 1	3 48	22 10	4 19	22 6	10 59	18 0	11 23	17 1																	
S.	17	6 38	5 33	8 11	6 5	8 10	4 49	22 2	5 25	22 0	11 50	17 4	—	—																	
●.	18	7 31	6 37	8 9	7 9	8 9	6 1	22 0	6 38	22 3	0 19	17 3	0 51	17 1																	
M.	19	8 25	7 43	8 10	8 20	8 11	7 13	22 7	7 48	23 0	1 30	17 6	2 11	17 1																	
Tu.	20	9 20	8 52	9 1	9 24	9 2	8 19	23 5	8 48	23 11	2 46	18 3	3 20	18 1																	
W.	21	10 17	9 55	9 3	10 24	9 4	9 16	24 4	9 43	24 9	3 53	19 2	4 25	19 1																	
Th.	22	11 15	10 52	9 5	11 20	9 6	10 9	25 1	10 34	25 4	4 55	20 0	5 24	20 1																	
F.	23	0h 11	11 47	9 6	—	—	10 59	25 6	11 23	25 8	5 51	20 6	6 15	20 1																	
S.	24	1 5	0 11	9 7	0 34	9 8	11 46	25 8	—	—	6 37	20 9	6 59	20 1																	
●.	25	1 57	0 57	9 8	1 18	9 8	0 8	25 8	0 29	25 6	7 19	20 7	7 39	20 1																	
M.	26	2 46	1 38	9 7	1 58	9 6	0 49	25 4	1 9	25 1	7 59	20 2	8 20	19 1																	
Tu.	27	3 32	2 19	9 6	2 39	9 5	1 30	24 8	1 49	24 2	8 40	19 6	9 0	19 1																	
W.	28	4 16	2 58	9 3	3 16	9 2	2 8	23 9	2 27	23 3	9 18	18 8	9 36	18 1																	
Th.	29	4 59	3 34	9 1	3 54	8 11	2 46	22 10	3 5	22 4	9 54	17 10	10 13	17 1																	
F.	30	5 41	4 14	8 10	4 35	8 9	3 25	21 10	3 46	21 3	10 32	17 0	10 52	16 1																	
Half Mean Spring } Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.																				
Phases of the Moon.																Moon's Declination at Noon.															
D. H. M.																M.D. ° '															
First Quarter - 1 8 22 Morning.																1 3 N.20 9 19 8. 6 17 5 N.18 25 15 N.															
Full - - - - - 9 9 41 Morning.																2 0 8.32 10 18 50 18 9 36 26 12															
Last Quarter - 16 11 53 Morning.																3 4 22 11 17 32 19 13 22 27 8															
New - - - - - 23 7 57 Morning.																4 8 3 12 15 14 20 16 20 28 4															
																5 11 26 13 12 4 21 18 17 29 0															
In Apogee - - 3 9 0 Morning.																6 14 24 14 8 13 22 19 6 30 22															
In Perigee - - 18 4 0 Afternoon.																7 16 46 15 3 52 23 18 46 31															
																8 18 23 16 0 N.43 24 17 21															

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,

GREENOCK add 18 m.

LIVERPOOL add 12 m.

PEMBROKE add 20 m.

JUNE, 1865.

WESTON-SUPER-MARE.										HOLYHEAD.										KINGSTOWN.										C's AGE AT NOON.
MORNING.					AFTERNOON.					MORNING.					AFTERNOON.					MORNING.					AFTERNOON.					
Time.	H.	M.	F.	L.	Time.	H.	M.	F.	L.	Time.	H.	M.	F.	L.	Time.	H.	M.	F.	L.	Time.	H.	M.	F.	L.	Time.	H.	M.	F.	L.	
11 39 29 5					—	—				3 13 12 11					3 43 12 9					4 12 9 1					4 41 8 11					D
0 7 28 11					0 37 28 8					4 16 12 7					4 49 12 7					5 11 8 10					5 41 8 10					8.5
1 8 28 7					1 39 28 8					5 21 12 7					5 51 12 9					6 10 8 10					6 38 8 11					9.5
2 11 28 11					2 43 29 5					6 19 12 11					6 47 13 1					7 6 9 1					7 34 9 3					10.5
3 14 29 11					3 44 30 5					7 12 13 3					7 36 13 6					8 1 9 4					8 27 9 5					11.5
4 14 31 1					4 41 31 10					7 59 13 9					8 21 14 0					8 52 9 7					9 17 9 9					12.5
5 7 32 7					5 31 33 3					8 41 14 3					9 0 14 6					9 40 9 11					9 59 10 1					13.5
5 55 33 10					6 17 34 4					9 20 14 8					9 39 14 11					10 18 10 2					10 37 10 4					14.5
6 38 34 8					6 58 35 1					9 58 15 1					10 16 15 2					10 55 10 5					11 13 10 6					15.5
7 19 35 6					7 40 35 10					10 34 15 3					10 52 15 4					11 33 10 7					11 53 10 7					16.5
7 58 36 0					8 16 36 0					11 9 15 5					11 28 15 4					—					0 12 10 7					17.5
8 35 36 1					8 55 36 0					11 50 15 4					—					0 32 10 7					0 53 10 6					18.5
9 16 35 10					9 37 35 5					0 12 15 3					0 36 15 2					1 15 10 5					1 39 10 4					19.5
9 57 35 0					10 18 34 5					1 2 15 0					1 28 14 9					2 3 10 2					2 28 10 1					20.5
10 39 33 10					11 2 33 3					1 55 14 7					2 23 14 4					2 54 10 0					3 22 9 11					21.5
11 27 32 7					11 53 32 1					2 52 14 2					3 24 14 0					3 50 9 9					4 22 9 8					22.5
—					0 24 31 8					3 57 13 10					4 34 13 9					4 55 9 7					5 29 9 6					23.5
0 56 31 6					1 29 31 7					5 9 13 10					5 41 14 0					6 0 9 6					6 29 9 7					24.5
2 5 31 10					2 43 32 3					6 13 14 2					6 45 14 4					7 0 9 9					7 32 9 11					25.5
3 20 32 10					3 56 33 6					7 15 14 6					7 44 14 9					8 4 10 0					8 35 10 2					26.5
4 32 34 3					5 6 35 0					8 12 15 0					8 38 15 3					9 7 10 4					9 37 10 5					27.5
5 36 35 7					6 5 36 1					9 4 15 6					9 29 15 8					10 4 10 7					10 27 10 9					28.5
6 33 36 5					6 58 36 7					9 53 15 9					10 15 15 10					10 50 10 10					11 12 10 11					29.5
7 21 36 9					7 43 36 9					10 36 15 10					10 55 15 9					11 34 10 11					11 56 10 10					30.5
8 3 36 7					8 22 36 5					11 14 15 8					11 34 15 6					—					0 17 10 9					31.5
8 41 36 1					9 0 35 8					11 56 15 4					—					0 38 10 8					0 59 10 6					32.5
9 19 35 3					9 37 34 8					0 18 15 2					0 40 14 11					1 21 10 4					1 42 10 2					33.5
9 53 33 11					10 9 33 3					1 1 14 7					1 22 14 4					2 2 10 0					2 22 9 10					34.5
10 25 32 6					10 41 31 8					1 43 14 0					2 5 13 9					2 43 9 9					3 4 9 7					35.5
10 59 30 11					11 19 30 2					2 27 13 6					2 51 13 2					3 26 9 5					3 50 9 3					36.5
Mean Spring Range. } 18ft. 7in.										8ft. 0in.										5ft. 6in.										

Equation of Time at Noon.

M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
2 28		9	1 5		17	0 34		25	2 18	
2 18		10	0 53		18	0 47		26	2 31	
2 9		11	0 41		19	1 0		27	2 43	
1 59		12	0 29		20	1 13		28	2 56	
1 49		13	0 17		21	1 26		29	3 8	
1 38		14	0 4		22	1 39		30	3 20	
1 27		15	0 8	Sub.	23	1 52				
1 16		16	0 21		24	2 5				

s of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

JUNE, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRAMIT.	BELFAST.								LONDONDERRY.								SLIGO BAY.												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.								
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.											
Th.	1	6 42	3 54	8 3	4 22	8 2	1 16	5 8	1 51	5 7	10 52	8 5	11 24																		
F.	2	7 3	4 52	8 1	5 22	8 1	2 28	5 7	3 0	5 8	11 55	8 4	—																		
S.	3	7 45	5 51	8 0	6 21	8 0	3 29	5 10	3 55	6 0	0 25	8 4	0 55																		
..	4	8 28	6 51	8 0	7 20	8 1	4 20	6 1	4 44	6 3	1 24	8 6	1 53																		
M.	5	9 13	7 46	8 2	8 10	8 4	5 4	6 4	5 24	6 5	2 19	8 10	2 42																		
Tu.	6	10 0	8 33	8 6	8 55	8 8	5 44	6 7	6 5	6 8	3 4	9 3	3 25																		
W.	7	10 48	9 16	8 9	9 36	8 11	6 26	6 10	6 46	6 11	3 43	9 9	4 1																		
Th.	8	11 39	9 56	9 0	10 15	9 1	7 8	7 0	7 29	7 1	4 20	10 2	4 42																		
F.	9	morn.	10 33	9 2	10 51	9 2	7 48	7 2	8 6	7 3	5 1	10 6	5 21																		
S.	10	0 32	11 11	9 3	11 30	9 3	8 24	7 4	8 42	7 4	5 41	10 9	6 0																		
..	11	1 25	11 48	9 3	—	—	8 59	7 4	9 17	7 3	6 17	10 9	6 37																		
M.	12	2 19	0 7	9 3	0 28	9 3	9 36	7 2	9 56	7 1	6 58	10 7	7 19																		
Tu.	13	3 12	0 51	9 2	1 15	9 2	10 18	7 0	10 42	6 11	7 42	10 3	8 5																		
W.	14	4 4	1 41	9 1	2 8	9 0	11 6	6 9	11 37	6 7	8 29	9 10	8 55																		
Th.	15	4 55	2 36	8 11	3 5	8 10	—	—	0 11	6 5	9 26	9 6	9 58																		
F.	16	5 47	3 34	8 9	4 5	8 8	0 48	6 3	1 27	6 2	10 33	9 3	11 7																		
S.	17	6 38	4 36	8 7	5 10	8 6	2 7	6 2	2 46	6 3	11 42	9 2	—																		
..	18	7 31	5 41	8 6	6 12	8 6	3 19	6 5	3 47	6 7	0 14	9 3	0 46																		
M.	19	8 25	6 45	8 6	7 20	8 7	4 15	6 9	4 42	6 11	1 18	9 5	1 52																		
Tu.	20	9 20	7 49	8 8	8 18	8 10	5 5	7 0	5 29	7 1	2 22	9 9	2 49																		
W.	21	10 17	8 46	9 0	9 13	9 2	5 56	7 3	6 23	7 4	3 16	10 3	3 41																		
Th.	22	11 15	9 40	9 3	10 5	9 4	6 50	7 5	7 17	7 6	4 6	10 9	4 31																		
F.	23	0 11	10 29	9 5	10 51	9 5	7 43	7 7	8 5	7 8	4 56	11 0	5 20																		
S.	24	1 5	11 13	9 5	11 33	9 4	8 26	7 8	8 45	7 7	5 43	11 2	6 3																		
..	25	1 57	11 52	9 3	—	—	9 4	7 6	9 23	7 4	6 23	10 11	6 43																		
M.	26	2 46	0 13	9 3	0 35	9 2	9 42	7 2	10 2	7 0	7 4	10 7	7 25																		
Tu.	27	3 32	0 57	9 2	1 19	9 1	10 21	6 11	10 41	6 9	7 45	10 1	8 4																		
W.	28	4 16	1 41	9 0	2 2	8 11	11 0	6 6	11 24	6 4	8 23	9 6	8 44																		
Th.	29	4 59	2 24	8 9	2 47	8 7	11 50	6 2	—	—	9 6	9 1	9 31																		
F.	30	5 41	3 10	8 6	3 33	8 4	0 18	5 11	0 48	5 9	9 57	8 8	10 25																		
Half Mean Spring Range.			4 ft. 9 in.								3 ft. 10 in.								5 ft. 7 in.												
Phases of the Moon.																Moon's Declination at Noon.															
D. H. M.																M.D. ° '															
First Quarter 1 8 22 Morning.																1 3 N. 20 9 19 8. 6 17 5 N. 18 25 1															
Full - - - - 9 9 41 Morning.																2 0 S. 32 10 18 50 18 9 36 26 1															
Last Quarter - 16 11 53 Morning.																3 4 22 11 17 32 19 13 22 27															
New- - - - - 23 7 57 Morning.																4 8 3 11 15 14 11 16 20 28															
In Apogee - - 3 9 0 Morning.																5 11 26 13 12 4 21 18 17 29															
In Perigee- - 18 4 0 Afternoon.																6 14 24 14 8 13 22 19 6 30															
																7 16 46 15 3 52 23 18 46															
																8 18 23 16 0 N. 43 24 17 31															

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required
 BELFAST subtract 3 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

JUNE, 1865.

WEEK DAY.	MONTH DAY.	GALWAY.				QUEENSTOWN.				WATERFORD.				C's AGE AT NOON.											
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.													
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.		D.										
1	10	1	11	0	10	32	10	10	10	4	9	3	10	31	9	2	10	24	10	3	10	53	10	0	D
2	11	5	10	10	11	37	10	10	11	2	9	1	11	34	9	1	11	23	9	11	11	51	9	10	8.5
3	—	—	—	—	0	7	10	11	—	—	—	—	0	5	9	2	—	—	—	—	0	19	9	10	9.5
4	0	36	11	1	1	5	11	4	0	36	9	3	1	7	9	4	0	47	10	0	1	16	10	1	10.5
5	1	30	11	7	1	53	11	10	1	37	9	6	2	5	9	8	1	46	10	3	2	15	10	5	11.5
6	2	16	12	1	2	39	12	5	2	32	9	10	2	56	10	1	2	44	10	8	3	11	10	10	12.5
7	3	1	12	8	3	21	12	11	3	19	10	4	3	41	10	6	3	36	11	1	4	0	11	3	13.5
8	3	42	13	2	4	2	13	5	4	3	10	8	4	25	10	10	4	24	11	5	4	47	11	7	14.5
9	4	21	13	7	4	39	13	10	4	45	11	0	5	4	11	2	5	7	11	8	5	27	11	9	0
10	4	58	14	0	5	19	14	2	5	25	11	3	5	46	11	4	5	46	11	10	6	7	12	0	16.5
11	5	38	14	2	5	58	14	2	6	5	11	4	6	24	11	4	6	26	12	0	6	45	12	1	17.5
12	6	19	14	2	6	41	14	0	6	45	11	4	7	6	11	3	7	6	12	1	7	27	12	1	18.5
13	7	4	13	11	7	28	13	9	7	28	11	2	7	51	11	1	7	49	12	1	8	11	12	0	19.5
14	7	53	13	6	8	19	13	3	8	14	10	11	8	36	10	9	8	32	11	11	8	54	11	9	20.5
15	8	47	12	11	9	15	12	7	9	1	10	7	9	26	10	5	9	17	11	7	9	41	11	5	21.5
16	9	45	12	4	10	15	12	2	9	52	10	3	10	18	10	1	10	8	11	3	10	38	11	0	0
17	10	50	12	1	11	24	12	2	10	49	10	0	11	22	10	0	11	11	10	10	11	41	10	9	23.5
18	11	57	12	3	—	—	—	—	11	55	10	0	—	—	—	—	—	—	—	—	0	10	10	9	24.5
19	0	30	12	5	1	3	12	8	0	29	10	1	1	7	10	3	0	41	10	10	1	15	11	0	25.5
20	1	33	12	11	2	1	13	3	1	42	10	5	2	15	10	7	1	50	11	2	2	26	11	5	26.5
21	2	30	13	6	2	59	13	9	2	47	10	10	3	17	11	0	3	2	11	7	3	35	11	10	27.5
22	3	26	14	0	3	51	14	3	3	46	11	3	4	14	11	5	4	5	12	0	4	35	12	1	28.5
23	4	16	14	5	4	38	14	6	4	39	11	6	5	3	11	7	5	2	12	2	5	26	12	3	●
24	5	0	14	7	5	22	14	7	5	27	11	8	5	50	11	7	5	48	12	3	6	10	12	3	1.2
25	5	44	14	6	6	4	14	4	6	11	11	7	6	31	11	6	6	31	12	3	6	51	12	2	2.2
26	6	25	14	2	6	46	13	11	6	51	11	4	7	12	11	2	7	12	12	1	7	33	12	0	3.2
27	7	7	13	7	7	27	13	4	7	31	11	0	7	51	10	9	7	52	11	10	8	10	11	9	4.2
28	7	47	13	0	8	8	12	8	8	9	10	7	8	26	10	5	8	27	11	7	8	45	11	4	5.2
29	8	29	12	3	8	51	11	10	8	44	10	2	9	4	9	11	9	2	11	2	9	19	10	11	6.2
30	9	13	11	6	9	37	11	2	9	24	9	8	9	44	9	6	9	38	10	9	10	1	10	6	7.2
Half Mean Spring Range.		7ft. 5in.				5ft. 10in.				6ft. 2in.															

Equation of Time at Noon.

M. D.	M. S.		M. D.	M. S.		M. D.	M. S.		M. D.	M. S.	
1	2 28	Add.	9	1 5	Add.	17	0 34	Sub.	25	2 18	Sub.
2	2 18		10	0 53		18	0 47		26	2 31	
3	2 9		11	0 41		19	1 0		27	2 43	
4	1 59		12	0 29		20	1 13		28	2 56	
5	1 49		13	0 17		21	1 26		29	3 8	
6	1 38		14	0 4		22	1 39		30	3 20	
7	1 27		15	0 8	Sub.	23	1 52				
8	1 16		16	0 21		24	2 5				

the times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. QUEENSTOWN add 8 m WATERFORD add 3 m.

JULY, 1865.

WEEK DAY.		MONTH DAY.	MOON'S TRANSIT.		BREST.				DEVONPORT.				PORTSMOUTH.												
					MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.										
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.								
			H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.									
S.	1	6 24	9	14	0	9	28	13	9	10	29	12	0	10	53	12	0	4	34	10	6	4	57	10	
M.	2	7 7	9	59	13	8	10	32	13	7	11	21	11	8	11	54	11	10	5	22	10	1	5	52	10
Tu.	3	7 52	11	6	13	8	11	40	13	10	—	—	—	0	31	11	10	6	23	9	11	6	55	9	11
W.	4	8 40	—	—	—	—	0	13	14	1	1	7	12	0	1	42	12	3	7	27	10	1	8	0	10
Th.	5	9 30	0	44	14	5	1	14	14	10	2	17	12	5	2	48	12	10	8	34	10	6	9	5	10
F.	6	10 22	1	40	15	5	2	3	16	0	3	19	13	1	3	47	13	9	9	32	11	0	9	57	11
S.	7	11 16	2	25	16	7	2	47	17	2	4	13	13	10	4	37	14	6	10	20	11	6	10	43	11
M.	8	morn.	3	9	17	9	3	31	18	2	5	1	14	5	5	24	15	2	11	5	12	0	11	27	12
Tu.	9	0 10	3	52	18	6	4	13	18	9	5	44	14	10	6	6	15	7	11	48	12	4	—	—	—
W.	10	1 5	4	34	19	0	4	53	19	2	6	28	15	2	6	50	15	11	0	9	12	6	0	31	12
Th.	11	1 59	5	13	19	3	5	34	19	2	7	9	15	4	7	29	15	11	0	52	12	8	1	14	12
F.	12	2 52	5	56	19	1	6	19	18	11	7	50	15	3	8	11	15	8	1	36	12	8	1	58	12
S.	13	3 44	6	42	18	7	7	5	18	2	8	33	14	11	8	54	15	3	2	20	12	7	2	43	12
M.	14	4 36	7	30	17	9	7	56	17	1	9	14	14	6	9	38	14	8	3	6	12	4	3	30	12
Tu.	15	5 28	8	22	16	6	8	52	16	0	10	3	14	0	10	29	13	11	3	55	11	10	4	20	11
W.	16	6 21	9	20	15	7	9	52	15	4	10	57	13	5	11	27	13	3	4	48	11	4	5	16	11
Th.	17	7 15	10	30	15	2	11	8	15	1	—	—	—	0	1	13	0	5	45	10	10	6	0	20	10
F.	18	8 10	11	47	15	2	—	—	—	0	42	13	0	1	21	13	1	6	57	10	8	7	34	10	
S.	19	9 6	0	24	15	5	0	59	15	9	2	0	13	2	2	38	13	6	8	12	11	0	8	50	11
M.	20	10 1	1	32	16	3	2	1	16	9	3	13	13	8	3	45	14	3	9	24	11	5	9	55	11
Tu.	21	10 56	2	28	17	3	2	51	17	9	4	14	14	2	4	41	14	11	10	23	11	11	10	47	12
W.	22	11 48	3	14	18	2	3	36	18	5	5	6	14	8	5	29	14	10	11	10	12	2	11	32	12
Th.	23	0 38	3	56	18	6	4	17	18	7	5	51	14	11	6	12	15	1	11	52	12	5	—	—	—
F.	24	1 25	4	36	18	7	4	53	18	7	6	32	15	1	6	50	15	8	0	13	12	5	0	33	12
S.	25	2 10	5	10	18	5	5	27	18	3	7	7	14	11	7	22	15	4	0	53	12	4	1	10	12
M.	26	2 54	5	43	18	1	6	0	17	10	7	38	14	7	7	54	14	10	1	27	12	3	1	44	12
Tu.	27	3 37	6	18	17	6	6	36	17	1	8	10	14	1	8	25	14	3	2	1	12	0	2	19	11
W.	28	4 19	6	54	16	7	7	12	16	0	8	40	13	7	8	53	13	7	2	37	11	9	2	55	11
Th.	29	5 2	7	32	15	7	7	52	15	1	9	7	13	0	9	26	12	10	3	13	11	4	3	32	11
F.	30	5 46	8	12	14	6	8	35	14	0	9	45	12	5	10	4	12	2	3	50	10	10	4	9	10
S.	31	6 32	9	1	13	8	9	31	13	4	10	28	11	11	10	56	11	9	4	32	10	4	4	57	10
Half Mean Spring Range.			9ft. 6in.				7ft. 9in.				6ft. 4in.														
Phases of the Moon.										Moon's Declination at Noon.															
D. H. M.										M.D. ° ' "															
First Quarter - 1 1 40 Morning.										1 6 41 9 16 7 17 15 N. 29 25 6 11															
Full - - - - 8 8 27 Afternoon.										2 10 10 10 13 11 18 17 42 26 2 2															
Last Quarter - 15 4 26 Afternoon.										3 13 18 11 9 27 19 18 53 27 12 2															
New - - - - 22 6 29 Afternoon.										4 15 53 12 5 9 20 18 56 28 5 1															
First Quarter - 30 7 9 Afternoon.										5 17 49 13 0 33 21 17 56 29 8 4															
In Apogee - - 1 3 0 Morning.										6 18 54 14 4 N. 4 22 15 58 30 12															
In Perigee - - 13 7 0 Afternoon.										7 19 1 15 8 27 23 13 15 31 14															
In Apogee - - 28 10 0 Afternoon.										8 18 6 16 12 20 24 9 58															

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, -
 Brest add 16 m. Devonport add 17 m. Portsmouth add 6 m.

JULY, 1865.

MORNING LAT.	DOVER.								SHEERNESS.								LONDON.								C's AGE AT NOON.
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	D.						
1	4 14 15 3		4 36 14 11		5 46 13 7		6 11 13 5		7 18 16 8		7 40 16 5		D												
2	4 59 14 7		5 26 14 4		6 39 13 2		7 8 13 0		8 4 16 2		8 36 16 0		9'2												
3	5 54 14 3		6 22 14 4		7 40 13 0		8 15 13 0		9 10 15 11		9 42 15 9		10'2												
4	6 53 14 6		7 26 14 10		8 47 13 2		9 18 13 4		10 14 15 9		10 47 15 11		11'2												
5	7 59 15 2		8 30 15 6		9 50 13 7		10 21 13 9		11 20 16 0		11 50 16 2		12'2												
6	8 55 15 11		9 20 16 4		10 49 14 0		11 13 14 4		—		0 17 16 5		13'2												
7	9 44 16 9		10 8 17 1		11 36 14 7		11 58 14 11		0 42 16 9		1 4 17 1		14'2												
8	10 32 17 6		10 55 17 10		—		0 20 15 2		1 27 17 5		1 49 17 9		O												
9	11 19 18 2		11 42 18 5		0 42 15 5		1 4 15 7		2 10 18 1		2 32 18 5		16'2												
10	—		0 5 18 7		1 25 15 10		1 45 16 0		2 54 18 9		3 14 18 11		17'2												
11	0 27 18 9		0 49 18 11		2 5 16 1		2 24 16 1		3 35 19 1		3 54 19 3		18'2												
12	1 13 18 11		1 36 18 10		2 44 16 2		3 5 16 1		4 14 19 4		4 36 19 4		19'2												
13	2 0 18 9		2 23 18 7		3 26 16 0		3 49 15 11		4 58 19 3		5 19 19 2		20'2												
14	2 47 18 3		3 11 17 11		4 12 15 9		4 35 15 6		5 43 19 0		6 7 18 9		21'2												
15	3 36 17 6		4 2 17 0		5 0 15 2		5 26 14 10		6 33 18 5		6 59 18 1		C												
16	4 29 16 7		4 54 16 2		5 54 14 7		6 26 14 4		7 27 17 9		7 56 17 6		23'2												
17	5 21 15 9		5 52 15 7		6 58 14 1		7 32 13 11		8 26 17 2		9 2 16 11		24'2												
18	6 24 15 6		7 0 15 8		8 12 13 10		8 49 13 11		9 39 16 9		10 15 16 8		25'2												
19	7 38 15 11		8 15 16 3		9 25 14 1		10 1 14 4		10 52 16 9		11 29 16 10		26'2												
20	8 47 16 7		9 18 16 11		10 34 14 7		11 6 14 10		—		0 2 17 0		27'2												
21	9 47 17 3		10 13 17 7		11 34 15 0		12 0 15 3		0 35 17 3		1 2 17 7		28'2												
22	10 38 17 10		11 1 18 0		—		0 24 15 6		1 30 17 11		1 53 18 2		●												
23	11 24 18 2		11 46 18 3		0 47 15 8		1 10 15 9		2 16 18 5		2 38 18 7		0'7												
24	—		0 7 18 3		1 29 15 10		1 49 15 10		2 59 18 9		3 18 18 10		1'7												
25	0 27 18 3		0 46 18 3		2 7 15 10		2 25 15 9		3 37 18 11		3 54 18 11		2'7												
26	1 4 18 2		1 23 18 0		2 41 15 8		2 57 15 7		4 11 18 10		4 29 18 9		3'7												
27	1 41 17 10		1 59 17 7		3 13 15 5		3 30 15 3		4 46 18 7		5 2 18 5		4'7												
28	2 17 17 4		2 36 17 0		3 48 15 1		4 6 14 10		5 19 18 3		5 36 18 0		5'7												
29	2 55 16 8		3 13 16 3		4 24 14 7		4 43 14 3		5 53 17 9		6 13 17 6		6'7												
30	3 31 15 10		3 50 15 5		5 2 14 0		5 22 13 9		6 33 17 2		6 54 16 10		D												
31	4 12 15 0		4 35 14 7		5 44 13 5		6 9 13 2		7 14 16 6		7 37 16 3		8'7												
Mean Spring Range.				9ft. 4in.	8ft. 0in.				9ft. 7in.																

Equation of Time at Noon.

M. R.	Sub.	M. D.	M. R.	Sub.	M. D.	M. R.	Sub.	M. D.	M. R.	Sub.
3 31	Sub.	9	4 53	Sub.	17	5 49	Sub.	25	6 13	Sub.
3 43		10	5 2		18	5 54		26	6 13	
3 54		11	5 10		19	5 58		27	6 13	
4 5		12	5 18		20	6 2		28	6 12	
4 15		13	5 25		21	6 5		29	6 10	
4 25		14	5 32		22	6 8		30	6 8	
4 35		15	5 38		23	6 10		31	6 6	
4 44		16	5 44		24	6 12				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 Dover subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 6 m.

TIDE TABLES FOR THE

JULY, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
S.	1	6h 24	4 59	9 11	5 23	9 10	11 54	16 10	—	—	8 43	11 5	9 10	11
M.	2	7 7	5 47	9 9	6 14	9 8	0 23	16 6	0 52	16 4	9 39	11 0	10 11	10 1
Tu.	3	7 52	6 47	9 8	7 23	9 8	1 22	16 2	1 51	16 10	10 43	10 11	11 13	10 1
W.	4	8 40	7 55	9 9	8 26	9 10	2 19	16 3	2 48	16 7	11 42	11 1	—	—
Th.	5	9 30	8 57	10 0	9 28	10 2	3 18	17 0	3 49	17 5	0 11	11 4	0 40	11 1
F.	6	10 22	9 57	10 4	10 24	10 6	4 18	17 10	4 43	18 3	1 8	11 11	1 33	12 1
S.	7	11 16	10 47	10 8	11 10	10 11	5 5	18 8	5 26	19 0	1 57	12 6	2 21	12 10
S.	8	morn.	11 33	11 1	11 55	11 3	5 48	19 5	6 11	19 9	2 45	13 2	3 7	13 3
M.	9	0 10	—	—	0 17	11 4	6 33	20 0	6 55	20 4	3 27	13 8	3 47	14 0
Tu.	10	1 5	0 38	11 5	0 58	11 6	7 17	20 7	7 38	20 9	4 8	14 2	4 28	14 4
W.	11	1 59	1 19	11 6	1 39	11 6	7 58	20 11	8 18	21 0	4 47	14 6	5 7	14 9
Th.	12	2 52	1 59	11 6	2 21	11 5	8 40	21 0	9 12	20 10	5 29	14 4	5 52	14 7
F.	13	3 44	2 44	11 5	3 7	11 4	9 24	20 7	9 48	20 4	6 16	14 0	6 40	13 30
S.	14	4 36	3 29	11 2	3 52	11 10	10 11	20 0	10 36	19 7	7 5	13 7	7 32	13 4
S.	15	5 28	4 16	10 11	4 41	10 9	11 2	19 2	11 34	18 8	7 59	13 0	8 27	13 8
M.	16	6 21	5 8	10 7	5 38	10 5	—	—	0 9	18 3	8 58	12 5	9 29	12 0
Tu.	17	7 15	6 7	10 4	6 38	10 3	0 43	17 11	1 16	17 8	10 3	12 0	10 40	11 10
W.	18	8 10	7 18	10 3	7 57	10 3	1 49	17 6	2 22	17 7	11 15	11 10	11 48	12 1
Th.	19	9 6	8 33	10 4	9 8	10 6	2 55	17 10	3 29	18 3	—	—	0 20	12 0
F.	20	10 1	9 42	10 8	10 15	10 10	4 3	18 7	4 35	19 0	0 53	12 6	1 25	12 2
S.	21	10 56	10 45	11 0	11 12	11 2	5 3	19 4	5 29	19 1	1 56	13 0	2 24	13 2
S.	22	11 48	11 37	11 3	12 0	11 4	5 53	19 11	6 17	20 1	2 49	13 6	3 12	13 1
M.	23	0h 38	—	—	0 22	11 5	6 40	20 3	7 02	20 5	3 32	13 10	3 52	14 0
Tu.	24	1 25	0 41	11 5	1 1	11 5	7 20	20 5	7 40	20 5	4 11	14 1	4 30	14 0
W.	25	2 10	1 21	11 4	1 39	11 3	7 58	20 5	8 15	20 4	4 48	14 1	5 4	14 9
Th.	26	2 54	1 56	11 2	2 13	11 1	8 31	20 2	8 48	20 0	5 21	13 10	5 39	13 8
F.	27	3 37	2 31	11 0	2 48	10 11	9 6	19 8	9 24	19 4	5 57	13 4	6 15	13 0
S.	28	4 19	3 6	10 9	3 24	10 8	9 42	19 0	10 0	18 7	6 34	12 10	6 54	12 8
S.	29	5 2	3 42	10 6	4 0	10 4	10 18	18 2	10 38	17 9	7 14	12 4	7 34	12 8
M.	30	5 46	4 18	10 2	4 36	10 0	11 0	17 4	11 24	16 11	7 54	11 9	8 16	11 8
Tu.	31	6 32	4 57	9 10	5 21	9 8	11 52	16 6	—	—	8 41	11 2	9 9	10 10

Half Mean Spring }
Range. } 5ft. 9in.

10ft. 5in.

7ft. 2in.

Phases of the Moon.

	D.	H.	M.	
First Quarter	1	1	40	Morning.
Fall	8	8	27	Afternoon.
Last Quarter	15	4	26	Afternoon.
New	22	6	29	Afternoon.
First Quarter	30	7	9	Afternoon.
In Apogee	1	3	0	Morning.
In Perigee	13	7	0	Afternoon.
In Apogee	28	10	0	Afternoon.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	68.41		9	16 3.7		17	15 N. 29		25	6 18	
2	10 10		10	13 11		18	17 42		26	3 27	
3	13 18		11	9 27		19	18 53		27	1 26	
4	15 53		12	5 9		20	18 56		28	5 14	
5	17 49		13	0 33		21	17 56		29	8 49	
6	18 54		14	4 N. 4		22	15 58		30	12 3	
7	19 1		15	8 27		23	13 15		31	14 50	
8	18 6		16	12 20		24	9 58				

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required—

HARWICH subtract 6 m.

HULL add 1 m.

SUNDERLAND add 5 m.

JULY, 1865.

NORTH SHIELDS.				LEITH.				THURSO.				C's Age at Noon.
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	
8 51	10 2	9 20	10 0	7 46	13 0	8 14	12 9	1 36	9 11	2 5	9 8	D
9 51	9 11	10 23	9 10	8 43	12 7	9 16	12 5	2 35	9 6	3 9	9 5	9.2
0 55	9 11	11 25	10 0	9 50	12 6	10 19	12 7	3 46	9 4	4 17	9 4	10.2
1 55	10 2	—	—	10 48	12 8	11 17	12 11	4 49	9 5	5 19	9 6	11.2
0 24	10 4	0 53	10 6	11 47	13 1	—	—	5 49	9 9	6 16	10 1	12.2
1 20	10 9	1 42	11 0	0 14	13 5	0 36	13 9	6 37	10 6	6 57	11 0	13.2
2 4	11 4	2 25	11 8	0 58	14 2	1 20	14 7	7 16	11 6	7 35	11 11	14.2
2 47	12 0	3 7	12 4	1 42	15 0	2 4	15 4	7 54	12 4	8 14	12 8	O
3 28	12 7	3 48	12 10	2 26	15 8	2 46	15 11	8 34	12 11	8 54	13 1	16.2
4 9	13 0	4 29	13 2	3 6	16 1	3 25	16 3	9 14	13 2	9 34	13 3	17.2
4 49	13 2	5 10	13 2	3 45	16 3	4 6	16 3	9 55	13 3	10 18	13 1	18.2
5 33	13 1	5 56	13 0	4 28	16 2	4 51	16 1	10 41	13 0	11 5	12 10	19.2
6 20	12 11	6 43	12 9	5 14	15 11	5 37	15 9	11 29	12 7	11 55	12 4	20.2
7 7	12 6	7 33	12 3	6 3	15 6	6 30	15 2	—	—	0 21	12 0	21.2
8 1	11 11	8 32	11 6	6 57	14 9	7 26	14 5	0 49	11 7	1 18	11 3	C
9 5	11 2	9 39	11 0	8 1	14 1	8 33	13 10	1 51	11 0	2 24	10 9	23.2
0 16	10 10	10 52	10 10	9 8	13 7	9 47	13 6	3 0	10 7	3 42	10 5	24.2
1 27	10 11	—	—	10 21	13 6	10 55	13 7	4 20	10 4	4 56	10 4	25.2
0 2	11 0	0 34	11 2	11 27	13 10	12 0	14 0	5 29	10 5	6 1	10 9	26.2
1 5	11 4	1 35	11 7	—	—	0 29	14 4	6 30	11 1	6 55	11 6	27.2
2 2	11 10	2 28	12 1	0 56	14 8	1 23	15 1	7 19	11 11	7 39	12 4	28.2
2 51	12 4	3 12	12 7	1 47	15 5	2 9	15 8	7 59	12 8	8 19	12 10	●
3 33	12 9	3 52	12 11	2 32	15 10	2 50	16 0	8 38	12 11	8 56	12 11	0.7
4 12	12 11	4 31	12 11	3 8	16 0	3 26	15 11	9 15	12 11	9 34	12 10	1.7
4 50	12 10	5 7	12 8	3 45	15 10	4 2	15 8	9 52	12 8	10 10	12 6	2.7
5 25	12 6	5 43	12 4	4 19	15 6	4 38	15 4	10 28	12 4	10 45	12 1	3.7
6 1	12 2	6 19	12 0	4 55	15 2	5 13	15 0	11 4	11 10	11 24	11 6	4.7
6 37	11 10	6 56	11 6	5 32	14 9	5 52	14 5	11 44	11 2	—	—	5.7
7 15	11 3	7 36	11 0	6 12	14 1	6 33	13 9	0 4	10 11	0 24	10 7	6.7
7 58	10 8	8 22	10 3	6 53	13 6	7 16	13 0	0 45	10 3	1 8	9 11	D
8 49	9 11	9 19	9 9	7 44	12 9	8 13	12 6	1 34	9 8	2 4	9 5	8.7
Mean Spring } 6ft. 8in.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

L. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
3 31	Sub.	9	4 53	Sub.	17	5 49	Sub.	25	6 13	Sub.
3 43		10	5 2		18	5 54		26	6 13	
3 54		11	5 10		19	5 58		27	6 13	
4 5		12	5 18		20	6 2		28	6 12	
4 15		13	5 25		21	6 5		29	6 10	
4 25		14	5 32		22	6 8		30	6 8	
4 35		15	5 38		23	6 10		31	6 6	
4 44		16	5 44		24	6 12				

of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

JULY, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
S.	1	6 24	4 58	8 7	5 22	8 6	4 11	20 10	4 38	20 4	11 12	16 0	11 35	
M.	2	7 7	5 48	8 4	6 18	8 3	5 7	20 1	5 40	19 11	—	—	0	
Tu.	3	7 52	6 49	8 2	7 20	8 2	6 16	19 11	6 50	20 1	0 31	15 4	1 3	
W.	4	8 40	7 52	8 3	8 24	8 4	7 22	20 4	7 54	20 8	1 39	15 6	2 15	
Th.	5	9 30	8 56	8 5	9 27	8 7	8 25	21 2	8 52	21 8	2 49	16 3	3 22	
F.	6	10 22	9 53	8 8	10 18	8 10	9 16	22 3	9 38	22 10	3 50	17 4	4 17	
S.	7	11 16	10 42	8 11	11 5	9 1	10 0	23 5	10 21	23 10	4 43	18 5	5 8	
S.	8	morn.	11 29	9 2	11 52	9 4	10 43	24 4	11 52	24 9	5 33	19 5	5 57	
M.	9	0 10	—	—	0 15	9 6	11 27	25 3	11 48	25 7	6 19	20 4	6 40	
Tu.	10	1 5	0 37	9 7	0 58	9 8	—	—	0 9	25 10	7 12	20 11	7 21	
W.	11	1 59	1 19	9 9	1 39	9 10	0 29	26 1	0 50	26 3	7 40	21 2	8 1	
Th.	12	2 52	2 1	9 10	2 23	9 10	1 12	26 2	1 34	25 11	8 24	21 0	8 47	
F.	13	3 44	2 46	9 10	3 8	9 9	1 56	25 8	2 18	25 4	9 9	20 6	9 31	
S.	14	4 36	3 30	9 8	3 53	9 7	2 40	24 11	3 32	24 5	9 54	19 9	10 17	
S.	15	5 28	4 18	9 5	4 44	9 3	3 29	23 10	3 55	23 8	10 41	18 8	11 6	
M.	16	6 21	5 12	9 1	5 40	8 11	4 26	22 8	4 58	—	11 30	17 7	11 56	
Tu.	17	7 15	6 11	8 9	6 47	8 8	5 32	21 10	6 12	21 8	—	—	0 29	
W.	18	8 10	7 23	8 7	7 59	8 8	6 52	21 8	7 29	21 10	1 5	16 9	1 47	
Th.	19	9 6	8 36	8 9	9 12	8 10	8 42	3	8 37	22 8	2 27	17 2	3 6	
F.	20	10 1	9 45	9 0	10 16	9 1	9 8	23 2	9 36	23 8	3 41	18 2	4 15	
S.	21	10 56	10 44	9 2	11 10	9 3	10 24	2	10 26	24 6	4 46	19 2	5 14	
S.	22	11 48	11 35	9 4	11 59	9 5	10 49	24 10	11 11	25 1	5 40	19 11	6 3	
M.	23	0 38	—	—	0 20	9 6	11 32	25 4	11 52	25 5	6 23	20 4	6 43	
Tu.	24	1 25	0 40	9 7	1 0	9 7	—	—	0 11	25 5	7 22	20 6	7 20	
W.	25	2 10	1 19	9 7	1 36	9 7	0 30	25 5	0 47	25 4	7 37	20 4	7 54	
Th.	26	2 54	1 53	9 7	2 10	9 6	1 42	25 2	1 21	24 10	8 11	19 11	8 28	
F.	27	3 37	2 27	9 5	2 44	9 4	1 37	24 6	1 54	24 1	8 46	19 5	9 4	
S.	28	4 19	3 2	9 3	3 19	9 1	2 12	23 7	2 30	23 1	9 21	18 7	9 38	
S.	29	5 2	3 37	9 0	3 55	8 11	2 48	22 8	3 6	22 1	9 55	17 8	10 12	
M.	30	5 46	4 14	8 9	5 33	8 8	3 25	21 7	3 44	20 11	10 30	16 8	10 50	
M.	31	6 32	5 56	8 6	6 23	8 4	4 8	20 5	4 37	19 11	11 11	15 7	11 37	
Half Mean Spring Range.			4 ft. 10 in.				13 ft. 0 in.				10 ft. 6 in.			
Phases of the Moon.							Moon's Declination at Noon.							
			D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°
First Quarter	1	1 40	Morning.				1	6	8 41	9	16	8. 7	17	15 N. 29
Full	8	8 27	Afternoon.				2	10	10	10	13	11	18	17 42
Last Quarter	15	4 26	Afternoon.				3	13	18	11	9	27	19	18 53
New	22	6 29	Afternoon.				4	15	53	12	5	9	20	18 56
First Quarter	30	7 9	Afternoon.				5	17	49	13	0	33	21	17 56
							6	18	54	14	4	N. 4	22	15 58
In Apogee	1	3 0	Morning.				7	19	1	15	8	27	23	13 15
In Perigee	13	7 0	Afternoon.				8	18	6	16	12	20	24	9 58
In Apogee	28	10 0	Afternoon.											

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required

GREENOCK add 19 m.

LIVERPOOL add 12 m.

PEMBROKE add 20 m.

JULY, 1865.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's AGE AT NOON.		
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.				
		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.			
		H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	H. M. F. L.	IN		
S.	1	11 42 29	6	—	—	3 17 12	11	3 46 12	9	4 16 9	1	4 44 8	11	D		
M.	2	0 8 28	11	0 38 28	6	4 16 12	7	4 49 12	6	5 12 8	10	5 42 8	9	9.2		
Tu.	3	1 9 28	5	1 41 28	5	5 23 12	6	5 53 12	7	6 12 8	10	6 40 8	11	10.2		
W.	4	2 14 28	7	2 48 29	1	6 22 12	9	6 52 12	11	7 9 9	0	7 38 9	2	11.2		
Th.	5	3 23 29	7	3 58 30	3	7 20 13	2	7 48 13	5	8 9 9	3	8 39 9	5	12.2		
Fr.	6	4 28 31	1	4 57 32	1	8 12 13	9	8 34 14	1	9 6 9	7	9 31 9	10	13.2		
Sa.	7	5 24 33	0	5 49 33	10	8 55 14	5	9 16 14	9	9 54 10	0	10 16 10	2	14.2		
S.	8	6 14 34	8	6 38 35	4	9 38 15	0	9 59 15	4	10 36 10	5	10 56 10	7	○		
M.	9	7 1 36	0	7 23 36	7	10 19 15	7	10 39 15	9	11 16 10	9	11 37 10	10	16.2		
Tu.	10	7 44 37	1	8 3 37	5	10 57 15	11	11 15 16	0	11 57 11	0	—	—	17.2		
W.	11	8 23 37	7	8 44 37	8	11 35 16	1	11 58 16	0	0 18 10	11	0 39 10	11	18.2		
Th.	12	9 5 37	7	9 26 37	4	—	—	0 32 15	11	1 2 10	10	1 29 10	9	19.2		
Fr.	13	9 46 36	11	10 6 36	4	0 46 15	9	1 11 15	7	1 48 10	8	2 12 10	7	20.2		
Sa.	14	10 26 35	7	10 46 34	8	1 37 15	4	2 3 15	0	2 37 10	5	3 3 10	3	21.2		
S.	15	11 8 33	9	11 33 32	10	2 30 14	8	2 59 14	4	3 29 10	1	3 57 9	11	○		
M.	16	12 0 32	0	—	—	3 32 14	1	4 5 13	10	4 30 9	8	5 3 9	6	23.2		
Tu.	17	0 31 31	4	1 6 30	11	4 41 13	8	5 20 13	7	5 36 9	5	6 10 9	4	24.2		
W.	18	1 43 30	9	2 21 30	10	5 55 13	7	6 29 13	9	6 43 9	5	7 16 9	6	25.2		
Th.	19	3 0 31	3	3 41 31	10	7 1 13	11	7 33 14	1	7 49 9	11	8 23 9	9	26.2		
Fr.	20	4 19 32	6	4 55 33	4	8 4 14	4	8 32 14	8	8 57 9	11	9 29 10	12	27.2		
Sa.	21	5 27 34	2	5 55 34	10	8 57 14	11	9 20 15	2	9 57 10	3	10 20 10	5	28.2		
S.	22	6 21 35	5	6 45 35	9	9 43 15	4	10 5 15	6	10 40 10	7	11 1 10	8	●		
M.	23	7 7 36	1	7 27 36	4	10 23 15	7	10 41 15	8	11 20 10	9	11 39 10	9	0.7		
Tu.	24	7 46 36	6	8 4 36	5	10 58 15	8	11 15 15	7	11 59 10	9	—	—	1.7		
W.	25	8 20 36	4	8 36 36	2	11 32 15	6	11 50 15	5	0 18 10	8	0 36 10	7	2.7		
Th.	26	8 52 35	10	9 8 35	6	—	—	0 9 15	3	0 53 10	6	1 11 10	5	3.7		
Fr.	27	9 24 35	1	9 40 34	5	0 27 15	1	0 46 14	10	1 29 10	3	1 48 10	2	4.7		
Sa.	28	9 56 33	9	10 11 33	0	1 6 14	6	1 26 14	3	2 6 10	0	2 25 9	10	5.7		
S.	29	10 25 32	2	10 40 31	4	1 46 13	11	2 6 13	7	2 45 9	8	3 5 9	6	6.7		
M.	30	10 57 30	6	11 17 29	7	2 26 13	4	2 49 13	0	3 25 9	4	3 47 9	2	D		
Tu.	31	11 42 28	10	—	—	3 15 12	9	3 45 12	5	4 14 9	0	4 43 8	10	8.7		
Half Moon Spring } 18ft. 7in. Range.															8ft. 0in.	5ft. 6in.

Half Mean Spring } 18ft. 7in.
Range.

8ft. 0in.

5ft. 6in.

Equation of Time at Noon.

M.D.	M.	R.	Sub.	M.D.	M.	R.	Sub.	M.D.	M.	R.	Sub.	M.D.	M.	R.	Sub.
1	3	31	Sub.	9	4	53	Sub.	17	5	49	Sub.	25	6	13	Sub.
2	3	43		10	5	2		18	5	54		26	6	13	
3	3	54		11	5	10		19	5	58		27	6	13	
4	4	5		12	5	18		20	6	2		28	6	12	
5	4	15		13	5	25		21	6	5		29	6	10	
6	4	25		14	5	32		22	6	8		30	6	8	
7	4	35		15	5	38		23	6	10		31	6	6	
8	4	44		16	5	44		24	6	12					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 WESTON-SUPER-MARE add 19 m. } HOLYHEAD add 18 m. } KINGSTOWN subtract 1 m. for Dublin Time.

JULY, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.					
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.		
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.		
S.	1	6 ^h 24	3 58	8 3	4 25	8 2	1 20	5 8	1 54	5 7	10 55	8 5	11 25	8		
M.	2	7 7	4 53	8 1	5 23	8 0	2 28	5 7	3 0	5 7	11 56	8 3	—	—		
Tu.	3	7 52	5 53	8 0	6 23	8 0	3 31	5 9	3 58	5 11	0 27	8 3	0 57	8		
W.	4	8 40	6 54	8 0	7 25	8 1	4 24	6 0	4 48	6 2	1 27	8 5	1 57	8		
Th.	5	9 30	7 55	8 2	8 22	8 4	5 12	6 3	5 35	6 5	2 27	8 9	2 54	9		
F.	6	10 22	8 45	8 6	9 8	8 8	5 56	6 7	6 18	6 9	3 16	9 3	3 37	9		
S.	7	11 16	9 30	8 10	9 52	9 0	6 41	6 11	7 4	7 0	3 57	9 11	4 18	10		
S.	8	morn.	10 14	9 2	10 35	9 3	7 27	7 2	7 49	7 4	4 40	10 5	5 2	10		
M.	9	0 10	10 55	9 4	11 16	9 4	8 9	7 6	8 29	7 7	5 24	10 11	5 45	11		
Tu.	10	1 5	11 35	9 5	11 54	9 5	8 47	7 8	9 5	7 8	6 5	11 2	6 24	11		
W.	11	1 59	—	—	0 14	9 5	9 24	7 8	9 45	7 7	6 44	11 2	7 6	11		
Th.	12	2 52	0 37	9 5	1 1	9 5	10 6	7 6	10 28	7 5	7 29	10 11	7 52	10		
F.	13	3 44	1 25	9 5	1 50	9 4	10 51	7 3	11 16	7 1	8 15	10 6	8 38	10		
S.	14	4 36	2 17	9 3	2 44	9 1	11 46	6 11	—	—	9 4	10 0	9 33	9		
S.	15	5 28	3 12	8 11	3 41	8 10	0 18	6 7	0 55	6 4	10 5	9 6	10 39	9		
M.	16	6 21	4 12	8 8	4 44	8 7	1 35	6 3	2 14	6 2	11 14	9 2	11 49	9		
Tu.	17	7 15	5 16	8 6	5 50	8 5	2 53	6 2	3 29	6 3	—	—	0 24	9		
W.	18	8 10	6 25	8 4	7 1	8 4	4 0	6 5	4 29	6 7	0 59	9 0	1 34	9		
Th.	19	9 6	7 35	8 5	8 8	8 7	4 56	6 8	5 23	6 9	2 8	9 3	2 40	9		
F.	20	10 1	8 38	8 9	9 6	8 11	5 49	6 10	6 16	7 0	3 9	9 8	3 35	9		
S.	21	10 56	9 32	9 0	9 56	9 2	6 43	7 2	7 8	7 2	3 59	10 3	4 22	10		
S.	22	11 48	10 19	9 3	10 40	9 4	7 32	7 4	7 55	7 5	4 45	10 8	5 8	10		
M.	23	0 ^h 38	10 59	9 4	11 18	9 4	8 13	7 6	8 31	7 7	5 29	11 0	5 48	11		
Tu.	24	1 25	11 36	9 4	11 53	9 3	8 48	7 6	9 5	7 5	6 6	11 0	6 23	10		
W.	25	2 10	—	—	0 11	9 3	9 21	7 4	9 37	7 3	6 41	10 10	6 58	10		
Th.	26	2 54	0 29	9 3	0 47	9 2	9 53	7 1	10 9	7 0	7 16	10 5	7 33	10		
F.	27	3 37	1 5	9 1	1 24	9 0	10 27	6 10	10 45	6 8	7 51	10 0	8 8	9		
S.	28	4 19	1 45	8 11	2 6	8 10	11 4	6 6	11 26	6 4	8 26	9 6	8 46	9		
S.	29	5 2	2 26	8 8	2 47	8 7	11 51	6 1	—	—	9 7	9 0	9 31	8		
M.	30	5 46	3 9	8 5	3 31	8 3	0 17	5 10	0 46	5 7	9 56	8 6	10 23	8		
Tu.	31	6 32	3 56	8 2	4 24	8 1	1 18	5 6	1 54	5 5	10 54	8 2	11 28	8		
Half Mean Spring Range.			4 ^{ft.} 9 ^{in.}				3 ^{ft.} 10 ^{in.}				5 ^{ft.} 7 ^{in.}					
Phases of the Moon.							Moon's Declination at Noon.									
			D.	H.	M.		M.D.	°	'	M.D.	°	'	M.D.	°	'	
First Quarter-	1	1 40	Morning.				1	68.	41	9	168.	7	17	15 N. 29	25	6 N. 29
Full - - - -	8	8 27	Afternoon.				2	10	10	10	13	11	18	17 42	26	2 28
Last Quarter -	15	4 26	Afternoon.				3	13	18	11	9	27	19	18 53	27	18 29
New - - - -	22	6 29	Afternoon.				4	15	53	12	5	9	20	18 56	28	5 28
First Quarter-	30	7 9	Afternoon.				5	17	49	13	0	33	21	17 56	29	8 4
In Apogee - -	1	3 0	Morning.				6	18	54	14	4 N.	4	22	15 58	30	12 1
In Perigee - -	13	7 0	Afternoon.				7	19	1	15	8	27	23	13 15	31	14 50
In Apogee - -	28	10 0	Afternoon.				8	18	6	16	12	20	24	9 58		

The times for High Water are given for Mean Time at Place; if Dublin or Railway Time be required—
 BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

JULY, 1865.

GALWAY.								QUEENSTOWN.								WATERFORD.								C's Age at Noon.
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
L. M. F. I.	H. M. F. I.	H. M. F. I.	L. M. F. I.	H. M. F. I.	H. M. F. I.	L. M. F. I.	H. M. F. I.	L. M. F. I.	H. M. F. I.	H. M. F. I.	L. M. F. I.	H. M. F. I.	H. M. F. I.	L. M. F. I.	H. M. F. I.	H. M. F. I.	L. M. F. I.	H. M. F. I.	H. M. F. I.	L. M. F. I.	H. M. F. I.	H. M. F. I.	D.	
0 4 11 0	10 33	10 10	10 7 9 4	10 32	9 2	10 24	10 3	10 54	10 0)														
1 4 10 9	11 38	10 9	11 3 9 1	11 35	9 0	11 24	9 10	11 53	9 9	9.2														
— — — —	0 8	10 10	— — — —	0 6	9 0	— — — —	0 20	9 9	10.2															
0 39 11 0	1 9	11 2	0 38 9 1	1 11	9 3	0 50	9 10	1 21	10 0	11.2														
1 39 11 5	2 5	11 9	1 46 9 5	2 18	9 7	1 54	10 2	2 29	10 5	12.2														
2 30 12 1	2 53	12 6	2 45 9 10	3 11	10 2	2 58	10 8	3 26	10 11	13.2														
3 16 12 10	3 38	13 2	3 35 10 5	3 59	10 8	3 53	11 2	4 19	11 5	14.2														
4 0 13 7	4 22	13 11	4 22 10 11	4 45	11 2	4 44	11 8	5 8	11 11	○														
4 43 14 3	5 3	14 7	5 7 11 5	5 29	11 7	5 30	12 1	5 50	12 2	16.2														
5 24 14 9	5 44	14 10	5 51 11 8	6 11	11 10	6 11	12 4	6 31	12 6	17.2														
6 5 14 11	6 27	14 10	6 32 11 10	6 54	11 10	6 52	12 7	7 14	12 7	18.2														
6 50 14 9	7 13	14 7	7 16 11 9	7 38	11 8	7 37	12 7	7 59	12 6	19.2														
7 37 14 4	8 2	14 1	8 0 11 6	8 22	11 4	8 20	12 5	8 41	12 3	20.2														
8 28 13 9	8 54	13 3	8 44 11 1	9 8	10 10	9 2	12 1	9 24	11 10	21.2														
9 22 12 9	9 52	12 5	9 33 10 7	9 58	10 4	9 47	11 7	10 16	11 4	☾														
0 23 12 2	10 57	12 0	10 24 10 1	10 56	9 11	10 46	11 0	11 17	10 9	23.2														
1 35 11 11	— — — —	11 32	9 10	— — — —	11 50	10 7	— — — —	— — — —	24.2															
0 11 11 11	0 46	12 0	0 8 9 9	0 45	9 10	0 23	10 6	0 57	10 6	25.2														
1 19 12 2	1 51	12 5	1 24 9 11	2 2	10 1	1 32	10 8	2 12	10 10	26.2														
2 21 12 9	2 51	13 1	2 37 10 3	3 9	10 6	2 49	11 1	3 24	11 4	27.2														
3 19 13 4	3 42	13 8	3 38 10 9	4 4	11 0	3 56	11 6	4 24	11 9	28.2														
4 5 13 11	4 28	14 2	4 28 11 2	4 51	11 4	4 51	11 11	5 14	12 0	●														
4 47 14 4	5 6	14 5	5 12 11 5	5 33	11 6	5 34	12 1	5 53	12 2	0.7														
5 26 14 5	5 45	14 5	5 53 11 6	6 12	11 6	6 13	12 2	6 32	12 2	1.7														
5 2 14 4	6 19	14 2	6 28 11 5	6 45	11 4	6 50	12 2	7 7	12 1	2.7														
5 37 14 0	6 54	13 9	7 2 11 3	7 19	11 1	7 24	12 0	7 40	11 11	3.7														
7 13 13 6	7 32	13 3	7 37 10 11	7 55	10 9	7 57	11 10	8 14	11 8	4.7														
7 51 12 11	8 10	12 7	8 12 10 6	8 28	10 4	8 30	11 6	8 47	11 3	5.7														
3 30 12 2	8 50	11 9	8 45 10 1	9 3	9 10	9 3	11 1	9 18	10 10	6.7														
0 11 11 3	9 35	10 11	9 22 9 7	9 42	9 4	9 36	10 7	9 59	10 4)														
0 3 10 8	10 36	10 6	10 6 9 1	10 35	8 11	10 26	10 0	10 57	9 10	8.7														
Mean Spring } 7ft. 5in.				5ft. 10in.				6ft. 2in.																
Range.																								

Equation of Time at Noon.

M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
3 31	Sub.	9	4 53	Sub.	17	5 49	Sub.	25	6 13	Sub.
3 43		10	5 2		18	5 54		26	6 13	
3 54		11	5 10		19	5 58		27	6 13	
4 5		12	5 18		20	6 2		28	6 12	
4 15		13	5 25		21	6 5		29	6 10	
4 25		14	5 32		22	6 8		30	6 8	
4 35		15	5 38		23	6 10		31	6 6	
4 44		16	5 44		24	6 12				

if High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

TIDE TABLES FOR THE

AUGUST, 1865.

Wind Day.	Moon Day.	Moon's Transit.	BREST.				DEVONPORT.				PORTSMOUTH.							
			Morning.		Afternoon.		Morning.		Afternoon.		Morning.		Afternoon.					
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.				
		H. M.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.				
Tu.	1	7 20	10 7 13	3	10 44 13	3	11 26 11	8	—	—	5 25 9	11	5 59					
W.	2	8 10	11 23 13	5	—	—	0 4 11	7	0 43 11	10	6 34 9	8	7 13					
Th.	3	9 3	0 1 13	8	0 36 14	2	1 23 11	11	2 2 12	6	7 48 10	1	8 23					
F.	4	9 57	1 7 14	9	1 37 15	6	2 38 12	7	3 11 13	5	8 58 10	9	9 29					
S.	5	10 52	2 2 16	4	2 26 17	1	3 43 13	5	4 11 14	5	9 56 11	6	10 21					
M.	6	11 47	2 48 17	10	3 10 18	7	4 37 14	3	5 2 15	3	10 44 12	2	11 6					
Tu.	7	morn.	3 32 19	2	3 52 19	7	5 25 15	0	5 48 15	11	11 28 12	8	11 48					
W.	8	0 42	4 14 20	0	4 36 20	3	6 11 15	6	6 34 16	4	—	—	0 12					
Th.	9	1 36	4 56 20	4	5 17 20	5	6 57 15	11	7 16 16	5	0 33 13	2	0 56					
F.	10	2 30	5 39 20	3	6 1 20	0	7 36 15	10	7 58 16	3	1 18 13	3	1 40					
S.	11	3 23	6 23 19	8	6 46 19	2	8 20 15	7	8 43 15	8	2 2 13	1	2 24					
M.	12	4 17	7 8 18	5	7 33 17	8	9 1 15	2	9 21 14	11	2 46 12	9	3 8					
Tu.	13	5 11	7 59 16	10	8 26 16	0	9 45 14	5	10 10 14	0	3 32 12	1	3 57					
W.	14	6 6	8 54 15	4	9 26 14	9	10 35 13	6	11 4 13	2	4 23 11	4	4 51					
Th.	15	7 2	10 6 14	5	10 50 14	3	11 35 12	11	—	—	5 21 10	7	5 59					
F.	16	7 57	11 33 14	4	—	—	0 15 12	7	0 55 12	9	6 39 10	3	7 21					
S.	17	8 50	0 15 14	7	0 51 15	0	1 38 12	7	2 19 13	2	8 3 10	6	8 41					
M.	18	9 43	1 23 15	6	1 50 16	1	2 55 13	1	3 30 13	11	9 14 11	1	9 44					
Tu.	19	10 32	2 16 16	8	2 38 17	3	3 59 13	9	4 25 14	8	10 11 11	7	10 34					
W.	20	11 20	2 58 17	9	3 17 18	2	4 49 14	4	5 12 15	1	10 54 12	0	11 13					
Th.	21	0 8 6	3 36 18	5	3 54 18	7	5 31 14	8	5 50 15	5	11 32 12	4	11 50					
F.	22	0 50	4 13 18	8	4 30 18	9	6 9 14	11	6 26 15	6	—	—	0 9					
S.	23	1 33	4 46 18	9	5 1 18	7	6 44 15	0	6 59 15	4	0 27 12	5	0 44					
M.	24	2 15	5 17 18	5	5 32 18	3	7 12 14	10	7 26 14	11	1 1 13	4	1 17					
Tu.	25	2 58	5 47 18	0	6 2 17	8	7 40 14	6	7 55 14	5	1 33 12	3	1 48					
W.	26	3 42	6 17 17	3	6 34 16	10	8 9 14	0	8 24 13	9	2 2 11	11	2 18					
Th.	27	4 26	6 51 16	3	7 11 15	8	8 37 13	5	8 51 13	1	2 35 11	7	3 52					
F.	28	5 13	7 32 15	0	7 53 14	5	9 9 12	9	9 28 12	5	3 11 11	1	3 31					
S.	29	6 1	8 17 13	10	8 44 13	5	9 48 12	3	10 13 11	10	3 51 10	7	4 14					
M.	30	6 51	9 16 13	1	9 54 13	11	10 43 11	11	11 15 11	6	4 40 10	0	5 11					
Tu.	31	7 44	10 37 13	1	11 21 13	4	11 53 11	10	—	—	5 47 9	8	6 27					
Half Mean Spring Range.			9 ^{ft.} 6 ^{in.}				7 ^{ft.} 9 ^{in.}				6 ^{ft.} 4 ^{in.}							
Phases of the Moon.							Moon's Declination at Noon.											
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Full - - - - - 7 5 29 Morning.							1	17	8. 0	9	28. 7	17	18 N. 9	25	7	1	18	0
Last Quarter - 13 9 42 Afternoon.							2	18	25	10	2 N. 37	18	16 31	26	10	2	19	0
New- - - - - 21 7 17 Morning.							3	18	57	11	7 13	19	14 4	27	13	3	20	0
First Quarter- 29 11 46 Morning.							4	18	29	12	11 15	20	11 1	28	16	4	21	0
							5	16	57	13	14 37	21	7 31	29	17	5	22	0
In Perigee - - 9 7 0 Afternoon.							6	14	23	14	17 4	22	3 45	30	18	6	23	0
In Apogee - - 25 3 0 Afternoon.							7	10	55	15	18 30	23	0 S. 7	31	19	7	24	0
							8	6	44	16	18 51	24	3 56					

AUGUST, 1865.

DOVER.						SHEERNESS.						LONDON.						C's Age at Noon.
MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			
Time. M. F. I.	Height.		Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.		Time. H. M. F. I.	Height.		
1 14 3	14	3	5 32 14 0	14	0	6 38 12 11	12	11	7 11 12 10	8	6 15 11	8 38 15 9	38	15	9	9.7		
3 13 11	13	11	6 38 14 1	14	1	7 48 12 9	12	9	8 25 12 10	9	14 15 7	9 51 15 6	51	15	6	10.7		
14 14 5	14	5	7 51 14 11	14	11	9 3 13 0	13	0	9 39 13 3	10	28 15 7	11 5 15 9	5	15	9	11.7		
23 15 5	15	5	8 52 16 0	16	0	10 13 13 7	13	7	10 42 14 0	11	42 16 0	—	—	—	—	12.7		
19 16 7	16	7	9 44 17 2	17	2	11 11 14 5	14	5	11 35 14 9	0	15 16 5	0 43 16 10	43	16	10	13.7		
9 17 8	17	8	10 33 18 3	18	3	11 58 15 2	15	2	—	—	1 7 17 4	1 30 17 9	30	17	9	14.7		
56 18 8	18	8	11 20 19 1	19	1	0 21 15 7	15	7	0 43 15 11	1	51 18 3	2 13 18 8	51	18	8	15.7		
44 19 5	19	5	—	—	—	1 5 16 3	16	3	1 25 16 6	2	34 19 1	2 55 19 5	34	19	5	16.7		
7 19 7	19	7	0 30 19 9	19	9	1 46 16 8	16	8	2 7 16 9	3	16 19 9	3 38 19 11	16	19	11	17.7		
53 19 10	19	10	1 17 19 9	19	9	2 28 16 10	16	10	2 48 16 10	3	59 20 0	4 19 20 1	59	20	1	18.7		
40 19 7	19	7	2 4 19 4	19	4	3 9 16 9	16	9	3 30 16 6	4	39 20 0	5 0 19 10	39	20	10	19.7		
27 19 0	19	0	2 50 18 5	18	5	3 53 16 4	16	4	4 16 16 0	5	22 19 7	5 45 19 3	22	19	3	20.7		
14 17 10	17	10	3 38 17 3	17	3	4 39 15 7	15	7	5 3 15 2	6	9 18 11	6 33 18 5	9	18	5	21.7		
4 16 8	16	8	4 30 16 0	16	0	5 29 14 9	14	9	5 59 14 4	6	59 17 11	7 26 17 6	59	17	6	22.7		
58 15 5	15	5	5 32 15 0	15	0	6 30 13 11	13	11	7 5 13 7	7	58 17 0	8 33 16 7	58	17	0	23.7		
8 14 9	14	9	6 47 14 11	14	11	7 47 13 5	13	5	8 31 13 5	9	13 16 4	9 56 16 2	31	16	4	24.7		
29 15 3	15	3	8 6 15 7	15	7	9 12 13 7	13	7	9 52 13 10	10	38 16 3	11 19 16 4	52	16	3	25.7		
38 16 0	16	0	9 7 16 5	16	5	10 27 14 1	14	1	10 57 14 5	11	56 16 6	—	—	—	—	26.7		
34 16 9	16	9	9 58 17 2	17	2	11 24 14 8	14	8	11 49 14 11	0	25 16 10	0 52 17 2	49	16	10	27.7		
20 17 7	17	7	10 41 17 10	17	10	—	—	—	0 11 15 2	1 18 17 6	1 41 17 10	18 17 10	11	17	10	28.7		
1 18 1	18	1	11 22 18 3	18	3	0 31 15 5	15	5	0 50 15 7	2 2 18 2	2 22 18 5	22 18 5	2	18	5	29.7		
42 18 4	18	4	—	—	—	1 9 15 9	15	9	1 27 15 11	2 41 18 7	2 57 18 9	41 18 9	27	18	9	30.7		
1 18 5	18	5	0 19 18 5	18	5	1 45 15 11	15	11	2 2 15 11	3 14 18 11	3 30 19 0	14 18 11	2	19	0	31.7		
36 18 4	18	4	0 53 18 3	18	3	2 17 15 10	15	10	2 33 15 9	3 46 19 0	4 2 18 11	33 18 11	46	19	11	32.7		
10 18 1	18	1	1 26 17 11	17	11	2 48 15 8	15	8	3 2 15 7	4 18 18 10	4 33 18 9	48 18 9	2	18	9	33.7		
42 17 9	17	9	1 58 17 6	17	6	3 17 15 5	15	5	3 31 15 2	4 49 18 7	5 6 18 4	58 18 4	31	18	4	34.7		
15 17 2	17	2	2 34 16 8	16	8	3 47 15 0	15	0	4 4 14 8	5 21 18 1	5 37 17 10	47 17 10	21	18	10	35.7		
53 16 3	16	3	3 12 15 10	15	10	4 22 14 4	14	4	4 42 14 0	5 53 17 6	6 12 17 2	53 17 2	42	17	2	36.7		
32 15 4	15	4	3 55 14 11	14	11	5 2 13 8	13	8	5 25 13 5	6 33 16 10	6 55 16 5	55 16 5	25	16	5	37.7		
19 14 5	14	5	4 47 14 0	14	0	5 51 13 1	13	1	6 21 12 10	7 19 16 1	7 48 15 10	51 15 10	21	16	10	38.7		
20 13 10	13	10	5 57 13 10	13	10	6 56 12 7	12	7	7 34 12 7	8 24 15 7	9 5 15 5	56 15 5	34	15	5	39.7		
in Spring } 9ft. 4in.						8ft. 0in.						9ft. 7in.						
nge.																		

Equation of Time at Noon.

S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
2		9	5 14		17	3 49		25	1 52	
58		10	5 5		18	3 36		26	1 36	
54		11	4 55		19	3 22		27	1 19	
49		12	4 46		20	3 8		28	1 1	
43		13	4 35		21	2 54		29	0 44	
36		14	4 24		22	2 39		30	0 26	
29		15	4 13		23	2 24		31	0 7	
22		16	4 1		24	2 8				

High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

AUGUST, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRAMBIT.	HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
Tu.	1	7 20	5 47	9 7	6 17	9 6	0 23	16 2	0 55	16 0	9 42	10 9	10 17	10												
W.	2	8 10	6 55	9 6	7 34	9 7	1 28	15 10	2 15	15 10	10 52	10 8	11 27	10												
Th.	3	9 3	8 11	9 8	8 46	9 10	2 35	16 1	3 8	16 7	12 0	11 0	—	—												
F.	4	9 57	9 20	10 0	9 50	10 3	3 41	17 1	4 11	17 9	0 32	11 5	1 11	11												
S.	5	10 52	10 20	10 7	10 46	10 10	4 40	18 4	5 4	18 11	1 30	12 4	1 57	12												
S.	6	11 47	11 10	11 1	11 34	11 4	5 27	19 6	5 49	20 0	2 22	13 2	2 46	13												
M.	7	no m.	11 56	11 7	—	—	6 12	20 6	6 35	20 11	3 7	14 0	3 27	14												
Tu.	8	0 42	0 18	11 9	0 38	11 10	6 56	21 4	7 18	21 11	3 47	14 8	4 9	15												
W.	9	1 36	0 59	11 11	1 21	12 0	7 40	21 11	8 1	22 0	4 30	15 2	4 51	15												
Th.	10	2 30	1 42	12 0	2 3	11 11	8 22	22 1	8 44	21 11	5 12	15 3	5 34	15												
F.	11	3 23	2 25	11 10	2 48	11 9	9 6	21 8	9 29	21 3	5 56	14 9	6 10	14												
S.	12	4 17	3 11	11 7	3 34	11 5	9 52	20 9	10 14	20 2	6 44	14 2	7 8	13												
S.	13	5 11	3 56	11 2	4 19	10 11	10 39	19 6	11 6	18 11	7 34	13 3	8 1	12												
M.	14	6 6	4 43	10 8	5 11	10 5	11 40	18 4	—	—	8 31	12 5	9 2	12												
Tu.	15	7 2	5 40	10 2	6 12	10 0	0 14	17 8	0 50	17 2	9 36	11 8	10 18	11												
W.	16	7 57	6 54	9 11	7 39	9 11	1 28	16 10	2 6	16 9	10 58	11 4	11 36	11												
Th.	17	8 50	8 20	10 0	8 59	10 2	2 43	17 0	3 21	17 5	—	—	0 13	11												
F.	18	9 43	9 34	10 4	10 6	10 7	3 56	17 10	4 26	18 4	0 46	11 11	1 16	12												
S.	19	10 32	10 35	10 9	11 0	10 11	4 53	18 9	5 17	19 2	1 45	12 8	2 12	12												
S.	20	11 20	11 23	11 1	11 44	11 3	5 39	19 6	6 0	19 10	2 35	13 2	2 56	13												
M.	21	0 26	—	—	0 3	11 4	6 20	20 1	6 39	20 3	3 14	13 8	3 32	13												
Tu.	22	0 50	0 22	11 5	0 39	11 5	6 58	20 5	7 16	20 6	3 50	14 0	4 8	14												
W.	23	1 33	0 57	11 6	1 15	11 5	7 34	20 7	7 51	20 6	4 24	14 3	4 40	14												
Th.	24	2 15	1 32	11 4	1 47	11 3	8 6	20 5	8 21	20 4	4 56	14 1	5 11	13												
F.	25	2 58	2 3	11 2	2 19	11 1	8 37	20 2	8 52	19 11	5 27	13 9	5 43	13												
S.	26	3 42	2 35	11 0	2 49	10 10	9 7	19 6	9 23	19 2	5 58	13 3	6 15	13												
S.	27	4 26	3 5	10 8	3 22	10 6	9 40	18 9	9 57	18 3	6 33	12 8	6 52	12												
M.	28	5 13	3 39	10 4	3 58	10 2	10 18	17 10	10 39	17 4	7 13	12 0	7 34	11												
Tu.	29	6 1	4 17	10 0	4 38	9 10	11 4	16 10	11 32	16 5	7 57	11 5	8 23	11												
W.	30	6 51	5 3	9 8	5 30	9 6	—	—	0 6	16 0	8 53	10 9	9 27	10												
Th.	31	7 44	6 2	9 5	6 42	9 5	0 40	15 3	1 16	15 7	10 6	10 6	10 46	10												

Half Mean Spring } 5ft. 9in.
Range

10ft. 5in.

7ft. 2in.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.	M.	
Full - - - - -	7	5	29	Morning.
Last Quarter -	13	9	42	Afternoon.
New - - - - -	21	7	17	Morning.
First Quarter	29	11	46	Morning.
In Perigee - -	9	7	0	Afternoon.
In Apogee - -	25	3	0	Afternoon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	17	S. 0	9	2	S. 7	17	18	N. 9	25	7	N.
2	18	25	10	2	N. 37	18	16	31	26	10	5
3	18	57	11	7	10	19	14	4	27	13	4
4	18	29	12	11	15	20	11	1	28	16	1
5	16	57	13	14	37	21	7	31	29	17	4
6	14	23	14	17	4	22	3	45	30	18	4
7	10	55	15	18	30	23	0	8. 7	31	18	4
8	6	44	16	18	51	24	3	56			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
HARWICH subtract 6 m. HULL add 1 m. SUNDERLAND add 6 m.

AUGUST, 1865.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	
Tu.	1	9 54	9 7	10 30	9 7	8 46	12 3	9 24	12 2	2 38	9 3	3 17	9 1	9.7
W.	2	11 5	9 8	11 40	9 10	10 0	12 3	10 34	12 4	3 57	9 1	4 34	9 2	10.7
Th.	3	—	—	0 14	10 1	11 7	12 7	11 39	12 11	5 9	9 3	5 41	9 7	11.7
F.	4	0 46	10 4	1 13	10 9	—	—	0 8	13 4	6 9	10 0	6 35	10 7	12.7
S.	5	1 39	11 1	2 3	11 6	0 34	13 10	0 58	14 5	6 57	11 3	7 17	11 10	13.7
S.	6	2 26	12 0	2 48	12 5	1 21	14 11	1 44	15 6	7 36	12 5	7 55	12 11	14.7
M.	7	3 8	12 10	3 28	13 3	2 6	16 0	2 27	16 5	8 15	13 5	8 35	13 8	15.7
Tu.	8	3 48	13 7	4 10	13 10	2 47	16 9	3 7	16 11	8 55	13 11	9 15	14 0	16.7
W.	9	4 31	13 11	4 53	13 11	3 27	17 1	3 48	17 1	9 37	14 1	9 59	14 0	17.7
Th.	10	5 15	13 11	5 37	13 9	4 9	17 0	4 32	16 11	10 22	13 11	10 45	13 7	18.7
F.	11	6 0	13 7	6 24	13 4	4 55	16 8	5 18	16 5	11 9	13 3	11 33	12 11	19.7
S.	12	6 47	13 1	7 10	12 8	5 42	16 1	6 6	15 8	11 58	12 5	—	—	20.7
S.	13	7 36	12 3	8 5	11 9	6 33	15 1	7 0	14 7	0 24	11 11	0 52	11 5	21.7
M.	14	8 37	11 2	9 11	10 9	7 32	14 1	8 5	13 7	1 23	11 0	1 55	10 7	22.7
Tu.	15	9 49	10 6	10 30	10 4	8 40	13 3	9 23	13 0	2 32	10 2	3 17	9 11	23.7
W.	16	11 10	10 4	11 49	10 5	10 5	13 0	10 43	13 1	4 3	9 10	4 43	9 9	24.7
Th.	17	—	—	0 25	10 8	11 20	13 3	11 53	13 6	5 22	9 11	5 54	10 2	25.7
F.	18	0 58	10 10	1 27	11 1	—	—	0 21	13 10	6 23	10 7	6 47	11 0	26.7
S.	19	1 52	11 5	2 16	11 8	0 46	14 3	1 11	14 7	7 8	11 6	7 27	11 11	27.7
S.	20	2 38	12 1	2 57	12 4	1 34	15 0	1 54	15 5	7 45	12 4	8 2	12 8	28.7
M.	21	3 14	12 7	3 32	12 9	2 13	15 8	2 31	15 10	8 19	12 10	8 36	12 11	29.7
Tu.	22	3 50	12 11	4 8	13 0	2 48	16 0	3 5	16 1	8 53	13 0	9 10	13 0	30.7
W.	23	4 25	13 0	4 42	12 11	3 21	16 1	3 37	16 0	9 26	12 11	9 43	12 10	31.7
Th.	24	4 59	12 9	5 15	12 8	3 53	15 10	4 9	15 8	9 59	12 8	10 15	12 6	32.7
F.	25	5 31	12 6	5 47	12 4	4 25	15 6	4 41	15 3	10 31	12 3	10 47	12 0	33.7
S.	26	6 2	12 1	6 18	11 11	4 56	15 1	5 12	14 10	11 4	11 8	11 23	11 4	34.7
S.	27	6 35	11 8	6 54	11 4	5 31	14 6	5 51	14 2	11 42	11 0	—	—	35.7
M.	28	7 15	11 0	7 37	10 7	6 12	13 9	6 33	13 4	0 3	10 7	0 25	10 2	36.7
Tu.	29	8 2	10 3	8 29	9 10	6 56	13 0	7 24	12 7	0 48	9 10	1 15	9 6	37.7
W.	30	9 2	9 7	9 39	9 5	7 56	12 4	8 31	12 1	1 47	9 3	2 23	9 0	38.7
Th.	31	10 18	9 5	10 58	9 7	9 11	12 0	9 53	12 1	3 4	8 11	3 50	9 0	39.7
Half Mean Spring } Range.		6ft. 8in.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.	M.D.	M.	S.	Sub.
1	6	2	Sub.	9	5	14	Sub.	17	3	49	Sub.	25	1	52	Sub.
2	5	58		10	5	5		18	3	36		26	1	36	
3	5	54		11	4	55		19	3	22		27	1	19	
4	5	49		12	4	46		20	3	8		28	1	1	
5	5	43		13	4	35		21	2	54		29	0	44	
6	5	36		14	4	24		22	2	39		30	0	26	
7	5	29		15	4	13		23	2	24		31	0	7	
8	5	22		16	4	1		24	2	8					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required—for
NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

AUGUST, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.								
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.							
		H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	
Tu.	1	7 20	6 51	8 2	7 25	8 1	5 10	19 7	5 48	19 6	—	—	0 8	15 1	—	—	—	—	—	—	—	—	—	—	—	—	—
W.	2	8 10	7 0	8 0	7 36	8 1	6 28	19 7	7 6	19 9	0 41	14 11	1 21	15 1	0 41	14 11	1 21	15 1	0 41	14 11	1 21	15 1	0 41	14 11	1 21	15 1	
Th.	3	9 3	8 13	8 2	8 48	8 4	7 42	20 3	8 17	20 10	2 15	5 5	2 40	15 4	2 15	5 5	2 40	15 4	2 15	5 5	2 40	15 4	2 15	5 5	2 40	15 4	
F.	4	9 57	9 20	8 6	9 50	8 9	8 45	21 7	9 13	22 5	3 14	16 8	3 46	17 1	3 14	16 8	3 46	17 1	3 14	16 8	3 46	17 1	3 14	16 8	3 46	17 1	
S.	5	10 52	10 17	8 11	10 43	9 1	9 37	23 2	10 0	24 0	4 16	18 3	4 43	19 1	4 16	18 3	4 43	19 1	4 16	18 3	4 43	19 1	4 16	18 3	4 43	19 1	
M.	6	11 47	11 7	9 3	11 30	9 6	10 22	24 8	10 44	25 4	5 9	19 8	5 34	20 1	5 9	19 8	5 34	20 1	5 9	19 8	5 34	20 1	5 9	19 8	5 34	20 1	
Tu.	7	morn.	11 53	9 8	—	—	11 6	25 11	11 28	26 6	5 58	20 11	6 20	21 1	5 58	20 11	6 20	21 1	5 58	20 11	6 20	21 1	5 58	20 11	6 20	21 1	
W.	8	0 42	0 15	9 10	0 38	10 0	11 50	27 0	—	—	6 41	21 11	7 23	22 4	6 41	21 11	7 23	22 4	6 41	21 11	7 23	22 4	6 41	21 11	7 23	22 4	
Th.	9	1 36	1 0	10 1	1 22	10 2	0 11	27 3	0 53	27 6	7 23	22 4	7 44	23 1	7 23	22 4	7 44	23 1	7 23	22 4	7 44	23 1	7 23	22 4	7 44	23 1	
F.	10	2 30	1 43	10 2	2 5	10 2	0 54	27 7	1 16	27 5	8 6	22 2	8 28	23 1	8 6	22 2	8 28	23 1	8 6	22 2	8 28	23 1	8 6	22 2	8 28	23 1	
S.	11	3 23	2 27	10 2	2 50	10 1	1 38	26 11	1 59	26 6	8 51	21 6	9 13	22 1	8 51	21 6	9 13	22 1	8 51	21 6	9 13	22 1	8 51	21 6	9 13	22 1	
M.	12	4 17	3 12	9 11	3 33	9 9	2 21	25 11	2 43	25 2	9 34	20 4	9 56	21 1	9 34	20 4	9 56	21 1	9 34	20 4	9 56	21 1	9 34	20 4	9 56	21 1	
Tu.	13	5 11	3 56	9 6	4 21	9 4	3 6	24 4	3 32	23 6	10 19	18 11	10 43	19 1	10 19	18 11	10 43	19 1	10 19	18 11	10 43	19 1	10 19	18 11	10 43	19 1	
W.	14	6 6	4 48	9 2	5 15	8 11	3 59	22 8	4 30	21 10	11 7	17 5	11 34	16 1	11 7	17 5	11 34	16 1	11 7	17 5	11 34	16 1	11 7	17 5	11 34	16 1	
Th.	15	7 2	5 46	8 11	6 25	8 6	5 4	21 2	5 47	20 10	—	—	0 8	16 1	—	—	0 8	16 1	—	—	0 8	16 1	—	—	0 8	16 1	
F.	16	7 57	7 5	8 4	7 46	8 4	6 34	20 9	7 16	20 11	0 46	16 0	1 32	16 1	0 46	16 0	1 32	16 1	0 46	16 0	1 32	16 1	0 46	16 0	1 32	16 1	
S.	17	8 50	8 27	8 6	9 3	8 7	7 55	21 3	8 30	21 9	2 18	16 4	2 56	16 1	2 18	16 4	2 56	16 1	2 18	16 4	2 56	16 1	2 18	16 4	2 56	16 1	
M.	18	9 43	9 36	8 9	10 5	8 11	9 0	22 4	9 26	22 11	3 31	17 5	4 3	18 1	3 31	17 5	4 3	18 1	3 31	17 5	4 3	18 1	3 31	17 5	4 3	18 1	
Tu.	19	10 32	10 31	9 0	10 55	9 1	9 51	23 6	10 12	24 0	4 31	18 6	4 58	19 1	4 31	18 6	4 58	19 1	4 31	18 6	4 58	19 1	4 31	18 6	4 58	19 1	
W.	20	11 20	11 17	9 3	11 38	9 4	10 32	24 5	10 52	24 10	5 22	19 6	5 43	19 1	5 22	19 6	5 43	19 1	5 22	19 6	5 43	19 1	5 22	19 6	5 43	19 1	
Th.	21	0 26	11 58	9 5	—	—	11 11	25 1	11 30	25 4	6 22	20 2	6 41	20 1	6 22	20 2	6 41	20 1	6 22	20 2	6 41	20 1	6 22	20 2	6 41	20 1	
F.	22	0 50	0 18	9 6	0 36	9 6	11 48	25 6	—	—	6 39	20 7	6 56	20 1	6 39	20 7	6 56	20 1	6 39	20 7	6 56	20 1	6 39	20 7	6 56	20 1	
S.	23	1 33	0 54	9 7	1 11	9 7	0 6	25 7	0 23	25 7	7 12	20 8	7 28	20 1	7 12	20 8	7 28	20 1	7 12	20 8	7 28	20 1	7 12	20 8	7 28	20 1	
M.	24	2 15	1 28	9 7	1 44	9 7	0 39	25 6	0 54	25 4	7 44	20 4	7 59	20 1	7 44	20 4	7 59	20 1	7 44	20 4	7 59	20 1	7 44	20 4	7 59	20 1	
Tu.	25	2 58	1 58	8 7	2 13	9 6	1 9	25 1	1 24	24 9	8 15	19 11	8 29	19 1	8 15	19 11	8 29	19 1	8 15	19 11	8 29	19 1	8 15	19 11	8 29	19 1	
W.	26	3 42	2 28	9 5	2 44	9 3	1 38	24 3	1 53	23 10	8 45	19 2	9 2	18 1	8 45	19 2	9 2	18 1	8 45	19 2	9 2	18 1	8 45	19 2	9 2	18 1	
Th.	27	4 26	3 0	9 2	3 16	9 0	2 10	23 3	2 27	22 9	9 18	18 2	9 36	17 1	9 18	18 2	9 36	17 1	9 18	18 2	9 36	17 1	9 18	18 2	9 36	17 1	
F.	28	5 13	3 34	8 11	3 54	8 9	2 45	22 2	3 5	21 6	9 54	17 2	10 13	16 1	9 54	17 2	10 13	16 1	9 54	17 2	10 13	16 1	9 54	17 2	10 13	16 1	
S.	29	6 1	4 15	8 7	4 38	8 5	3 26	20 10	3 51	20 3	10 33	16 0	10 56	15 1	10 33	16 0	10 56	15 1	10 33	16 0	10 56	15 1	10 33	16 0	10 56	15 1	
M.	30	6 51	5 5	8 3	5 36	8 1	4 21	19 8	4 55	19 3	11 23	14 11	11 56	14 1	11 23	14 11	11 56	14 1	11 23	14 11	11 56	14 1	11 23	14 11	11 56	14 1	
Tu.	31	7 44	6 13	8 0	6 53	8 0	5 35	19 2	6 21	19 4	—	—	0 34	14 1	—	—	0 34	14 1	—	—	0 34	14 1	—	—	0 34	14 1	
Half Mean Spring Range.			4 ft. 10 in.				13 ft. 0 in.				10 ft. 6 in.																
Phases of the Moon.												Moon's Declination at Noon.															
D. H. M.												M.D. ° ' "															
Full - - - - - 7 5 29 Morning.												1 17 S. 0 9 28. 7 17 18 N. 9 25 7 23															
Last Quarter - 13 9 42 Afternoon.												2 18 25 10 2 N. 37 18 16 31 26 10 54															
New - - - - - 21 7 17 Morning.												3 18 57 11 7 10 19 14 4 27 13 4															
First Quarter - 29 11 46 Morning.												4 18 29 12 11 15 20 11 1 28 16															
In Perigee - - 9 7 0 Afternoon.												5 16 57 13 14 37 21 7 31 29 17 4															
In Apogee - - 25 3 0 Afternoon.												6 14 23 14 17 4 22 3 45 30 18 4															
												7 10 55 15 18 30 23 0 8. 7 31 18 3															
												8 6 44 16 18 51 24 3 56															

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
 GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

AUGUST, 1865.

ESTON-SUPER-MARE.					HOLYHEAD.					KINGSTOWN.					C's Age at Noon.
MORNING.			AFTERNOON.		MORNING.			AFTERNOON.		MORNING.			AFTERNOON.		
no.	Height.		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.
11	28	3	0 44	27 10	4 19	12 3	4 57	12 3	5 15	8 8	5 48	8 8			9.7
20	27	9	1 58	28 0	5 33	12 3	6 8	12 5	6 21	8 8	6 55	8 10			10.7
35	28	5	3 12	29 2	6 41	12 8	7 13	13 0	7 28	9 0	8 1	9 2			11.7
49	30	2	4 24	31 4	7 41	13 5	8 9	13 10	8 32	9 5	9 2	9 8			12.7
55	32	7	5 24	33 10	8 33	14 4	8 55	14 9	9 30	9 11	9 55	10 2			13.7
50	35	0	6 15	36 1	9 17	15 3	9 38	15 8	10 17	10 5	10 36	10 9			14.7
39	37	1	7 2	37 10	9 59	16 0	10 19	16 4	10 56	11 0	11 16	11 2			○
25	38	8	7 46	39 2	10 40	16 7	10 59	16 9	11 38	11 4	11 59	11 4			16.7
7	39	5	8 27	39 6	11 18	16 10	11 39	16 10	—	—	0 21	11 4			17.7
48	39	5	9 9	39 1	—	—	0 2	16 9	0 43	11 4	1 6	11 3			18.7
30	38	6	9 50	37 9	0 26	16 7	0 51	16 3	1 29	11 1	1 53	10 11			19.7
9	36	8	10 28	35 6	1 16	15 11	1 40	15 6	2 16	10 9	2 40	10 6			20.7
48	34	3	11 11	32 11	2 6	15 0	2 33	14 6	3 5	10 3	3 32	10 0			○
36	31	8	—	—	3 4	14 1	3 36	13 7	4 2	9 9	4 35	9 5			22.7
6	30	7	0 44	29 9	4 13	13 3	4 56	13 1	5 10	9 2	5 48	9 1			23.7
25	29	5	2 7	29 6	5 38	13 0	6 16	13 1	6 26	9 1	7 4	9 2			24.7
50	29	11	3 30	30 6	6 53	13 4	7 26	13 6	7 41	9 4	8 16	9 6			25.7
6	31	4	4 41	32 2	7 56	13 10	8 22	14 1	8 48	9 8	9 18	9 10			26.7
12	33	1	5 39	34 0	8 46	14 6	9 7	14 10	9 45	10 0	10 7	10 3			27.7
3	34	10	6 24	35 4	9 27	15 1	9 46	15 4	10 26	10 5	10 43	10 7			28.7
44	35	9	7 4	36 2	10 4	15 6	10 21	15 8	11 0	10 8	11 18	10 9			●
23	36	6	7 40	36 8	10 37	15 9	10 53	15 9	11 36	10 10	11 53	10 10			1.2
56	36	8	8 12	36 6	11 8	15 9	11 23	15 7	—	—	0 10	10 9			2.2
27	36	4	8 41	36 2	11 39	15 6	11 56	15 4	0 27	10 8	0 43	10 7			3.2
55	35	9	9 9	35 4	—	—	0 13	15 2	0 59	10 6	1 15	10 5			4.2
23	34	9	9 38	34 0	0 29	14 11	0 46	14 8	1 31	10 3	1 47	10 0			5.2
53	33	2	10 8	32 3	1 5	14 4	1 25	14 0	2 5	9 10	2 24	9 8			6.2
23	31	4	10 40	30 4	1 45	13 8	2 6	13 3	2 45	9 6	3 6	9 4			7.2
0	29	5	11 25	28 6	2 29	12 11	2 56	12 7	3 28	9 1	3 54	8 11			8.2
56	27	9	—	—	3 28	12 3	4 4	12 1	4 26	8 9	5 0	8 7			9.2
32	27	4	1 13	27 6	4 44	12 0	5 26	12 2	5 36	8 6	6 15	8 7			10.2
in Spring } age.			18 ft. 7 in.		8 ft. 0 in.					5 ft. 6 in.					

Equation of Time at Noon.

A.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.	M. D.	M. S.	Sub.
2	Sub.	9	5 14	Sub.	17	3 49	Sub.	25	1 52	Sub.
58		10	5 5		18	3 36		26	1 36	
54		11	4 55		19	3 22		27	1 19	
49		12	4 46		20	3 11		28	1 1	
43		13	4 35		21	2 54		29	0 44	
36		14	4 24		22	2 39		30	0 26	
29		15	4 13		23	2 24		31	0 7	
22		16	4 1		24	2 8				

[High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 ESTON-MARE add 13 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

AUGUST, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	
Tu.	1	7 20	4 56	8 0	5 29	7 11	2 31	5 5	3 7	5 6	—	—	0 2	8	
W.	2	8 10	6 3	7 11	6 39	7 11	3 40	5 8	4 12	5 10	0 37	8 1	1 12	8	
Th.	3	9 3	7 14	8 0	7 47	8 1	4 40	6 0	5 7	6 2	1 47	8 4	2 20	8	
F.	4	9 57	8 16	8 3	8 43	8 6	5 31	6 5	5 54	6 7	2 48	8 11	3 14	9	
S.	5	10 52	9 7	8 9	9 30	9 0	6 17	6 10	6 41	7 1	3 37	9 9	3 58	10	
●	6	11 47	9 53	9 2	10 14	9 4	7 4	7 3	7 27	7 6	4 19	10 6	4 40	10 11	
M.	7	morn.	10 35	9 6	10 56	9 7	7 50	7 9	8 10	7 11	5 2	11 3	5 24	11 6	
Tu.	8	0 42	11 17	9 8	11 36	9 9	8 30	8 1	8 49	8 2	5 46	11 8	6 6	11 16	
W.	9	1 36	11 56	9 9	—	—	9 8	8 1	9 28	8 1	6 26	11 10	6 48	11 9	
Th.	10	2 30	0 18	9 9	0 42	9 9	9 49	8 0	10 10	7 10	7 11	11 7	7 33	11 4	
F.	11	3 23	1 6	9 8	1 30	9 7	10 32	7 8	10 55	7 5	7 56	11 1	8 18	10 9	
S.	12	4 17	1 55	9 5	2 21	9 3	11 20	7 2	11 50	6 10	8 41	10 4	9 7	10 0	
●	13	5 11	2 48	9 1	3 16	8 11	—	—	0 24	6 6	9 37	9 8	10 11	9 4	
M.	14	6 6	3 46	8 8	4 17	8 6	1 2	6 2	1 42	6 0	10 46	9 0	11 22	8 9	
Tu.	15	7 2	4 51	8 4	5 29	8 3	2 25	5 11	3 7	5 11	—	—	0 3	8	
W.	16	7 57	6 8	8 2	6 48	8 2	3 45	6 1	4 19	6 3	0 42	8 8	1 21	8 8	
Th.	17	8 50	7 27	8 2	8 1	8 4	4 51	6 4	5 17	6 6	2 0	8 10	2 33	9 1	
F.	18	9 43	8 30	8 6	8 56	8 8	5 42	6 7	6 7	6 9	3 1	9 4	3 26	9 1	
S.	19	10 32	9 21	8 10	9 43	9 0	6 31	6 11	6 54	7 1	3 48	9 11	4 9	10 2	
●	20	11 20	10 3	9 2	10 21	9 3	7 15	7 3	7 35	7 4	4 29	10 5	4 48	10 8	
M.	21	0 8	10 39	9 4	10 57	9 4	7 54	7 5	8 11	7 6	5 8	10 10	5 27	11 6	
Tu.	22	0 50	11 15	9 4	11 31	9 4	8 28	7 7	8 44	7 7	5 45	11 1	6 1	11 1	
W.	23	1 33	11 46	9 4	—	—	8 58	7 6	9 13	7 5	6 16	11 0	6 32	10 11	
Th.	24	2 15	0 2	9 3	0 19	9 3	9 28	7 4	9 42	7 2	6 48	10 9	7 4	10 1	
F.	25	2 58	0 35	9 3	0 51	9 2	9 56	7 1	10 10	6 11	7 20	10 4	7 34	10 1	
S.	26	3 42	1 7	9 1	1 25	9 0	10 26	6 9	10 44	6 7	7 50	9 10	8 7	9 1	
●	27	4 26	1 44	8 11	2 5	8 9	11 3	6 4	11 27	6 1	8 25	9 3	8 46	9 9	
■	28	5 13	2 26	8 7	2 48	8 5	11 54	5 10	—	—	9 19	8 9	9 35	8 4	
Tu.	29	6 1	3 11	8 3	3 38	8 2	0 24	5 7	0 57	5 5	10 3	8 3	10 37	8 1	
W.	30	6 51	4 8	8 0	4 41	7 11	1 34	5 4	2 16	5 3	11 13	7 11	11 51	7 11	
Th.	31	7 44	5 18	7 11	5 56	7 11	2 55	5 4	3 34	5 7	—	—	0 30	8 5	
Half Mean Spring Range.			4 ^{ft.} 9 ^{in.}				3 ^{ft.} 10 ^{in.}				5 ^{ft.} 7 ^{in.}				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'
Full - - - - - 7 5 29 Morning.							1	17	8. 0	9	28. 7	17	18 N. 9	25	72 34
Last Quarter - 13 9 42 Afternoon.							2	18	25	10	2 N. 37	18	16 31	26	10 54
New - - - - - 21 7 17 Morning.							3	18	57	11	7 10	19	14 4	27	13 46
First Quarter 29 11 46 Morning.							4	18	29	12	11 15	20	11 1	28	16 8
							5	16	57	13	14 37	21	7 31	29	17 42
In Perigee - - 9 7 0 Afternoon							6	14	23	14	17 4	22	3 45	30	18 46
In Apogee - - 25 3 0 Afternoon							7	10	55	15	18 30	23	0 5. 7	31	18 36
							8	6	44	16	18 51	24	3 56		

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—
BELFAST subtract 2 m. **LONDONDERRY** add 4 m. **SLIGO BAY** add 9 m.

AUGUST, 1865.

GALWAY.					QUEENSTOWN.					WATERFORD.					C's AGE AT NOON.	
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.				
Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.		Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.			Time. H. M.	Height. F. I.		
11 12 10 5		11 49 10 6			11 10 8 10				11 46 8 10				11 29 9 8			9.7
—	—	0 25 10 7			—	—			0 23 8 11				0 2 9 6			10.7
0 59 10 10		1 31 11 3			1 0 9 1				1 36 9 3				1 10 9 10			11.7
1 59 11 9		2 26 12 3			2 10 9 7				2 42 9 11				2 20 10 4			12.7
2 52 12 9		3 17 13 3			3 10 10 4				3 35 10 8				3 25 11 1			13.7
3 39 13 9		4 1 14 3			4 0 11 1				4 23 11 5				4 19 11 10			14.7
4 23 14 9		4 43 15 1			4 46 11 9				5 8 12 0				5 9 12 5			15.7
5 4 15 6		5 26 15 8			5 31 12 3				5 53 12 4				5 51 12 10			16.7
5 48 15 9		6 10 15 9			6 15 12 5				6 36 12 5				6 35 13 1			17.7
6 32 15 8		6 56 15 5			6 58 12 5				7 20 12 3				7 19 13 2			18.7
7 18 15 2		7 41 14 9			7 42 12 0				8 5 11 9				8 3 12 11			19.7
8 5 14 3		8 30 13 8			8 25 11 5				8 46 11 1				8 43 12 5			20.7
8 57 13 0		9 26 12 5			9 10 10 8				9 35 10 4				9 26 11 8			21.7
9 56 11 11		10 30 11 6			10 1 10 0				10 30 9 8				10 19 10 11			22.7
11 11 11 4		11 54 11 3			11 9 9 5				11 51 9 4				11 30 10 3			23.7
—	—	0 33 11 4			—	—			0 33 9 5				0 7 10 1			24.7
1 12 11 7		1 44 11 10			1 14 9 6				1 53 9 8				1 23 10 3			25.7
2 13 12 3		2 41 12 7			2 27 9 11				2 57 10 2				2 38 10 9			26.7
3 7 12 11		3 29 13 3			3 25 10 6				3 49 10 9				3 41 11 3			27.7
3 49 13 7		4 8 13 11			4 12 11 0				4 31 11 2				4 32 11 9			28.7
4 26 14 2		4 44 14 4			4 50 11 4				5 10 11 6				5 13 12 0			29.7
5 2 14 6		5 19 14 7			5 29 11 7				5 47 11 7				5 50 12 2			30.7
5 36 14 7		5 53 14 5			6 4 11 7				6 20 11 6				6 24 12 3			31.7
6 10 14 4		6 26 14 2			6 36 11 5				6 51 11 4				6 57 12 2			32.7
6 41 13 11		6 56 13 8			7 6 11 2				7 21 11 0				7 27 12 0			33.7
7 12 13 4		7 30 13 1			7 36 10 10				7 52 10 7				7 56 11 9			34.7
7 49 12 8		8 9 12 2			8 9 10 4				8 26 10 1				8 27 11 4			35.7
8 30 11 8		8 53 11 3			8 44 9 9				9 5 9 6				9 0 10 10			36.7
9 17 10 10		9 47 10 6			9 26 9 3				9 50 9 0				9 41 10 3			37.7
10 21 10 3		10 59 10 3			10 20 8 10				10 58 8 8				10 43 9 8			38.7
11 42 10 4		—			11 39 8 9				—	—			11 55 9 6			39.7
Mean Spring } Range. }					7ft. 5in.					5ft 10in.					6ft. 2in.	

Equation of Time at Noon.

M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.	M.D.	M. S.	Sub.
6 2	Sub.	9	5 14	Sub.	17	3 49	Sub.	25	1 52	Sub.
5 58		10	5 5		18	3 36		26	1 36	
5 54		11	4 55		19	3 22		27	1 19	
5 49		12	4 46		20	3 8		28	1 1	
5 43		13	4 35		21	2 54		29	0 44	
5 36		14	4 24		22	2 39		30	0 26	
5 29		15	4 13		23	2 24		31	0 7	
5 22		16	4 1		24	2 8				

s of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

TIDE TABLES FOR THE

SEPTEMBER, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
F.	1	8 37	—	—	0 21	13 10	0 35	11 7	1 18	12 5	7 9	9 10	7 49	10
S.	2	9 32	0 38	14 6	1 9	15 4	1 59	12 4	2 39	13 4	8 28	10 7	9 0	11
M.	3	10 27	1 36	16 3	2 3	17 3	3 14	13 4	3 44	14 5	9 30	11 6	9 57	11
M.	4	11 21	2 26	18 2	2 48	19 1	4 12	14 4	4 38	15 5	10 22	12 4	10 44	12
Tu.	5	12 14	3 9	19 11	3 30	20 5	5 4	15 3	5 27	16 8	11 5	13 0	11 26	13
W.	6	0 16	3 51	20 10	4 13	21 1	5 49	15 11	6 12	16 8	11 47	13 6	—	—
Th.	7	1 12	4 35	21 2	4 57	21 2	6 35	16 4	6 58	16 9	0 9	13 8	0 33	13
F.	8	2 7	5 19	21 0	5 40	20 8	7 19	16 4	7 40	16 5	0 57	13 8	1 20	13
S.	9	3 3	6 1	2	6 24	19 6	8 1	16 0	8 23	15 9	1 42	13 5	2 2	13
M.	10	4 0	6 47	18 8	7 10	17 9	8 43	15 5	9 3	14 11	2 25	12 11	2 48	13
M.	11	4 57	7 37	16 9	8 4	15 9	9 26	14 6	9 49	13 11	3 11	12 1	3 36	11
Tu.	12	5 53	8 34	14 11	9 8	14 3	10 16	13 7	10 45	12 10	4 2	11 3	4 31	10
W.	13	6 47	9 47	13 11	10 31	13 8	11 16	12 9	11 53	12 2	5 3	10 4	5 40	10
Th.	14	7 40	11 16	13 9	11 59	14 0	—	—	0 34	12 7	6 21	9	7 4	10
F.	15	8 30	—	—	0 35	14 5	1 18	12 2	1 59	13 0	7 46	10 3	8 25	10
S.	16	9 18	1 7	15 0	1 36	15 7	2 36	12 9	3 9	13 9	8 58	10 10	9 28	11
M.	17	10 3	1 59	16 3	2 20	16 10	3 37	13 5	4 2	14 4	9 53	11 5	10 15	11
M.	18	10 48	2 38	17 5	2 54	17 11	4 25	14 1	4 47	14 10	10 34	11 11	10 51	12
Tu.	19	11 31	3 12	18 3	3 29	18 6	5 6	14 7	5 24	15 3	11 8	12 3	11 25	12
W.	20	0 13	3 45	18 8	4 1	18 9	5 41	14 11	5 58	15 4	11 41	12 5	11 58	12
Th.	21	0 56	4 17	18 9	4 32	18 8	6 14	15 1	6 30	15 3	—	—	0 13	12
F.	22	1 39	4 47	18 7	5 2	18 5	6 44	15 0	6 57	14 11	0 30	12 5	0 47	12
S.	23	2 23	5 17	18 2	5 31	17 10	7 11	14 8	7 25	14 6	1 2	12 3	1 17	12
M.	24	3 8	5 47	17 6	6 3	17 2	7 39	14 3	7 54	13 11	1 33	12 1	1 48	11
M.	25	3 56	6 19	16 8	6 37	16 1	8 9	13 8	8 22	13 4	2 4	11 8	2 20	11
Tu.	26	4 44	6 58	15 6	7 19	14 11	8 39	13 2	8 59	12 8	2 38	11 3	2 58	11
W.	27	5 34	7 43	14 3	8 10	13 8	9 21	12 8	9 44	12 0	3 18	10 9	3 41	10
Th.	28	6 26	8 42	13 3	9 18	13 2	10 11	12 3	10 41	11 7	4 7	10 2	4 38	9
F.	29	7 18	10 0	13 2	10 45	13 5	11 16	12 1	—	—	5 12	9 9	5 52	9
S.	30	8 11	11 28	13 11	—	—	0 1	11 8	0 46	12 6	6 34	9 10	7 16	10
Half Mean Spring Range.			9 ft. 6 in.				7 ft. 9 in.				6 ft. 4 in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°
Full	-	-	-	-	5 1 52	Afternoon.	1	17	S. 33	9	13	N. 33	17	8 N. 24
Last Quarter	-	-	-	-	12 4 57	Morning.	2	15	29	10	16	20	18	4 45
New	-	-	-	-	19 10 46	Afternoon.	3	12	26	11	18	4	19	0 57
First Quarter	-	-	-	-	28 2 47	Morning.	4	8	33	12	1	41	20	2 S. 52
							5	4	4	13	18	14	21	6 32
In Perigee	-	-	-	-	6 9 0	Afternoon.	6	0	N. 43	14	16	50	22	9 56
In Apogee	-	-	-	-	22 4 0	Morning.	7	5	28	15	14	36	23	12 56
							8	9	51	16	11	44	24	15 25

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required—

BREST add 18 m.

1

DEVONPORT add 17 m.

1

PORTSMOUTH add 4 m.

SEPTEMBER, 1865.

MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's Age at Noon.
	MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	Time. H. M. P. L.	Height. F. I.	
1	6 35 14	1	7 15 14	7	8 20 12	9	9 0 13	0	9 46 15	5	10 26 15	7	11 2
2	7 53 15	2	8 25 15	11	9 40 13	5	10 15 13	10	11 5 15	10	11 40 16	3	12 2
3	8 53 16	7	9 20 17	3	10 44 14	4	11 13 14	10	—	—	0 10 16	9	13 2
4	9 46 18	0	10 10 18	8	11 36 15	3	12 0 15	9	0 38 17	3	1 5 17	10	14 2
5	10 33 19	3	10 56 19	8	—	—	0 21 16	3	1 28 18	5	1 50 19	0	15 2
6	11 20 20	1	11 43 20	3	0 42 16	7	1 3 16	11	2 11 19	6	2 33 19	10	16 2
7	—	—	0 7 20	5	1 24 17	2	1 45 17	3	2 53 20	2	3 15 20	5	17 2
8	0 32 20	5	0 56 20	4	2 7 17	3	2 29 17	3	3 37 20	6	3 57 20	7	18 2
9	1 19 20	1	1 41 19	8	2 50 17	2	3 10 16	11	4 19 20	5	4 39 20	3	19 2
10	2 6 19	3	2 29 18	7	3 30 16	7	3 53 16	2	5 2 19	11	5 24 19	6	20 2
11	2 52 17	11	3 17 17	2	4 17 15	9	4 41 15	2	5 48 19	0	6 11 18	6	21 2
12	3 43 16	5	4 11 15	8	5 7 14	8	5 36 14	2	6 37 17	11	7 4 17	3	22 2
13	4 40 15	0	5 14 14	7	6 9 13	8	6 47 13	3	7 38 16	9	8 14 16	4	23 2
14	5 51 14	4	6 30 14	5	7 28 13	1	8 12 13	1	8 55 16	0	9 37 15	10	24 2
15	7 12 14	9	7 50 15	2	8 55 13	3	9 36 13	6	10 21 15	10	11 3 16	0	25 2
16	8 23 15	7	8 51 16	0	10 12 13	10	10 42 14	1	11 40 16	2	—	—	26 2
17	9 16 16	6	9 38 16	11	11 10 14	5	11 32 14	9	0 8 16	6	0 35 16	10	27 2
18	9 58 17	4	10 17 17	8	11 52 15	0	—	—	0 59 17	3	1 21 17	7	28 2
19	10 36 17	11	10 55 18	2	0 11 15	4	0 28 15	6	1 40 17	11	1 58 18	3	29 2
20	11 13 18	3	11 31 18	4	0 45 15	8	1 3 15	10	2 15 18	6	2 31 18	8	0 6
21	11 47 18	5	—	—	1 18 15	11	1 34 15	11	2 46 18	10	3 1 18	11	1 6
22	0 4 18	4	0 21 18	4	1 49 15	11	2 3 15	10	3 17 19	0	3 33 18	11	2 6
23	0 37 18	2	0 54 18	0	2 18 15	9	2 33 15	8	3 47 18	11	4 3 18	10	3 6
24	1 11 17	10	1 27 17	7	2 47 15	7	3 1 15	4	4 19 18	8	4 34 18	6	4 6
25	1 44 17	4	2 1 17	0	3 16 15	2	3 32 14	11	4 49 18	3	5 5 18	0	5 6
26	2 19 16	7	2 39 16	1	3 49 14	7	4 7 14	3	5 22 17	9	5 40 17	5	6 6
27	2 59 15	8	3 22 15	2	4 28 13	11	4 49 13	7	5 59 17	1	6 22 16	8	7 6
28	3 48 14	9	4 16 14	4	5 15 13	3	5 45 13	0	6 45 16	4	7 13 16	0	8 6
29	4 48 14	1	5 24 14	0	6 19 12	9	6 58 12	8	7 46 15	9	8 26 15	6	9 6
30	6 2 14	2	6 42 14	7	7 42 12	9	8 26 13	0	9 9 15	7	9 52 15	8	10 6
Mean Spring Range. } 9ft. 4in.				8ft. 0in.				9ft. 7in.					

Equation of Time at Noon.

M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
0	11		9	2	50		17	5	38		25	8	25	
0	30		10	3	11		18	5	59		26	8	45	
0	50		11	3	32		19	6	20		27	9	5	
1	9		12	3	53		20	6	41		28	9	25	
1	29		13	4	14		21	7	2		29	9	45	
1	49		14	4	35		22	7	23		30	10	4	
2	9		15	4	56		23	7	44					
2	30		16	5	17		24	8	4					

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 DOVER subtract 5 m. SHEERNESS subtract 3 m. LONDON 0 m.

TIDE TABLES FOR THE

SEPTEMBER, 1865.

WEEK DAY.			MOON'S TRANSIT.			HARWICH.				HULL.				SUNDERLAND.												
MONTH DAY			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.		Time.		Height.	
			H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.
F.	1	8	37	7	27	9	6	8	8	9	8	1	54	15	9	2	32	16	1	11	25	10	9	—	—	—
S.	2	9	32	8	46	9	11	9	22	10	2	3	9	16	8	3	43	17	5	0	1	11	2	0	0	0
Mo.	3	10	27	9	52	10	6	10	22	10	10	4	13	18	3	4	40	18	11	1	3	12	3	1	1	1
M.	4	11	21	10	47	11	2	11	11	11	6	5	4	19	8	5	27	19	5	1	58	13	3	2	2	2
Tu.	5	morn.	—	11	34	11	9	11	55	12	0	5	49	21	0	6	11	21	7	2	46	14	4	3	3	3
W.	6	0	16	—	—	—	—	0	16	12	2	6	33	22	0	6	55	22	5	3	26	15	1	3	4	4
Th.	7	1	12	0	36	12	3	0	57	12	4	7	17	22	8	7	40	22	9	4	8	15	8	4	5	5
F.	8	2	7	1	20	12	4	1	43	12	3	8	2	22	9	8	23	22	7	4	52	15	9	5	6	6
S.	9	3	3	2	5	12	2	2	28	12	0	8	45	22	3	9	7	21	8	5	36	15	3	5	7	7
Mo.	10	4	0	2	49	11	9	3	12	11	6	9	30	21	1	9	53	20	4	6	21	14	4	6	8	8
M.	11	4	57	3	35	11	3	3	58	10	11	10	16	19	7	10	43	18	10	7	12	13	4	7	9	9
Tu.	12	5	53	4	22	10	7	4	50	10	4	11	17	18	0	11	53	17	4	8	9	12	3	8	10	10
W.	13	6	47	5	20	10	0	5	54	9	10	—	—	—	—	0	32	16	9	9	18	11	4	9	11	11
Th.	14	7	40	6	35	9	9	7	20	9	9	1	10	16	5	1	48	16	3	10	40	10	11	11	12	12
F.	15	8	30	8	3	9	10	8	43	10	0	2	27	16	5	3	5	16	11	11	57	11	3	—	—	—
S.	16	9	18	9	19	10	2	9	50	10	4	3	40	17	4	4	11	17	11	0	31	11	7	1	1	1
Mo.	17	10	3	10	19	10	7	10	43	10	9	4	39	18	5	5	1	18	11	1	29	12	4	1	2	2
M.	18	10	48	11	4	11	0	11	23	11	2	5	21	19	3	5	39	19	8	2	16	13	0	3	3	3
Tu.	19	11	31	11	40	11	4	11	58	11	5	5	57	19	11	6	15	20	2	2	52	13	6	3	4	4
W.	20	0	13	—	—	—	—	0	15	11	6	6	33	20	4	6	49	20	6	3	25	13	11	3	4	5
Th.	21	0	56	0	30	11	6	0	46	11	6	7	5	20	7	7	21	20	7	3	57	14	2	4	5	6
F.	22	1	39	1	1	11	5	1	17	11	4	7	37	20	6	7	52	20	5	4	26	14	2	4	6	7
S.	23	2	23	1	33	11	3	1	48	11	2	8	6	20	4	8	21	20	1	4	56	13	11	5	6	8
Mo.	24	3	8	2	3	11	1	2	19	10	11	8	36	19	9	8	52	19	5	5	27	13	6	5	7	9
M.	25	3	56	2	34	10	9	2	50	10	8	9	8	19	0	9	25	18	7	6	0	12	11	6	8	10
Tu.	26	4	44	3	7	10	6	3	25	10	3	9	43	18	2	10	4	17	8	6	37	12	3	6	9	11
W.	27	5	34	3	44	10	1	4	4	9	11	10	26	17	2	10	55	16	8	7	21	11	7	7	10	
Th.	28	6	26	4	29	9	9	4	56	9	7	11	27	16	3	—	—	—	—	8	17	10	11	8	8	11
F.	29	7	18	5	28	9	6	6	4	9	5	0	4	15	11	0	42	15	9	9	29	10	7	10	9	12
S.	30	8	11	6	49	9	6	7	34	9	8	1	21	15	10	2	0	16	1	10	52	10	9	11	9	13
Half Mean Spring Range,			5ft. 9in.				10ft. 5in.				7ft. 2in.															
Phases of the Moon.												Moon's Declination at Noon.														
D. H. M.												M.D. ° ' M.D. ° ' M.D. ° ' M.D. ° '														
Full - - - - - 5 1 52 Afternoon.												1 17 8.33 9 13 N.33 17 8 N.24 25														
Last Quarter - 12 4 57 Morning.												11 15 29 10 16 20 18 4 45 26														
New - - - - - 19 10 46 Afternoon.												3 12 26 11 18 4 19 0 57 27														
First Quarter - 28 2 47 Morning.												4 8 33 12 18 41 20 2 8.52 28														
												5 4 4 13 18 14 21 6 32 29														
In Perigee - - 6 9 0 Afternoon.												6 0 N.43 14 16 50 22 9 56 30														
In Apogee - - 22 4 0 Morning.												7 5 28 15 14. 36 23 12 56														
												8 9 51 16 11 44 24 15 25														

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 1 m.

SEPTEMBER, 1865.

NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	Time. H. M. P. I.	Height. F. I.	
1 38 9 10	—	—	—	10 31 12 4	11 8 12 9	4 31 9 1	5 10 9 5	11'2				
0 15 10 2	0 47 10 7	11 41 13 2	—	—	5 43 9 10	6 11 10 5	12'2					
1 15 11 1	1 40 11 7	0 9 13 9	0 34 14 4	6 35 11 2	6 56 11 10	13'2						
2 4 12 1	2 26 12 8	0 58 15 0	1 22 15 8	7 16 12 7	7 35 13 3	14'2						
2 47 13 2	3 6 13 8	1 44 16 4	2 4 16 10	7 53 13 10	8 12 14 3	15'2						
3 26 14 0	3 47 14 4	2 25 17 3	2 44 17 7	8 32 14 6	8 52 14 8	16'2						
4 8 14 6	4 31 14 6	3 4 17 8	3 26 17 8	9 15 14 8	9 38 14 7	17'2						
4 54 14 5	5 17 14 3	3 49 17 7	4 12 17 5	10 1 14 5	10 24 14 1	18'2						
5 40 14 0	6 2 13 8	4 35 17 1	4 56 16 9	10 46 13 8	11 10 13 2	19'2						
6 25 13 3	6 49 12 10	5 19 16 4	5 44 15 9	11 36 12 7	—	20'2						
7 13 12 3	7 42 11 8	6 10 15 2	6 38 14 6	0 2 12 0	0 30 11 4	21'2						
8 14 11 0	8 49 10 6	7 9 13 11	7 44 13 4	1 0 10 9	1 34 10 3	22'2						
9 28 10 2	10 11 10 0	8 22 12 11	9 4 12 8	2 13 9 10	2 57 9 7	23'2						
0 53 9 11	11 33 10 1	9 47 12 7	10 26 12 8	3 44 9 5	4 26 9 5	24'2						
—	0 11 10 3	11 4 12 10	11 38 13 1	5 6 9 6	5 40 9 9	25'2						
0 44 10 6	1 13 10 10	—	0 7 13 6	6 9 10 2	6 34 10 8	26'2						
1 39 11 2	2 0 11 6	0 33 13 11	0 54 14 4	6 53 11 2	7 11 11 8	27'2						
2 20 11 10	2 38 12 2	1 15 14 9	1 34 15 2	7 26 12 1	7 41 12 5	28'2						
2 53 12 5	3 9 12 8	1 51 15 6	2 8 15 9	7 56 12 9	8 12 12 11	29'2						
3 26 12 10	3 41 13 0	2 25 15 11	2 39 16 0	8 27 13 0	8 42 13 1	30'2						
3 57 13 0	4 12 13 0	2 54 16 1	3 8 16 1	8 56 13 0	9 12 13 11	31'2						
4 28 12 11	4 44 12 9	3 23 15 11	3 39 15 10	9 28 12 10	9 44 12 8	32'2						
4 59 12 7	5 15 12 5	3 54 15 8	4 9 15 6	9 59 12 5	10 15 12 2	33'2						
5 31 12 3	5 47 12 0	4 25 15 3	4 41 15 0	10 32 11 11	10 49 11 7	34'2						
6 4 11 10	6 21 11 6	4 58 14 9	5 16 14 5	11 8 11 11	11 27 10 10	35'2						
6 39 11 3	7 1 10 11	5 35 14 1	5 57 13 8	11 49 10 6	—	36'2						
7 24 10 6	7 53 10 1	6 20 13 3	6 47 12 10	0 12 10 1	0 39 9 9	37'2						
8 24 9 9	9 0 9 6	7 19 12 6	7 54 12 3	1 9 9 5	1 45 9 2	38'2						
9 42 9 6	10 23 9 7	8 34 12 2	9 17 12 2	2 26 9 1	3 12 9 1	39'2						
11 4 9 10	11 44 10 3	9 59 12 5	10 37 12 9	3 57 9 3	4 38 9 6	40'2						
Mean Spring } 6ft. 8in. Range.				8ft. 2in.				6ft. 7in.				

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
0 11		9	2 50		17	5 38		25	8 25	
0 30		10	3 11		18	5 59		26	8 45	
0 50		11	3 32		19	6 20		27	9 5	
1 9		12	3 53		20	6 41		28	9 25	
1 29		13	4 14		21	7 2		29	9 45	
1 49		14	4 35		22	7 23		30	10 4	
2 9		15	4 56		23	7 44				
2 30		16	5 17		24	8 4				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 NORTH SHIELDS add 6 m. | LEITH add 12 m. | THURSO add 14 m.

SEPTEMBER, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROK.																												
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																								
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																											
			H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.																									
F.	1	8 37	7 34	8 1	8 14	8 3	7 4	19 9	7 43	20 5	1 19	15 0	2 3																																		
S.	2	9 32	8 50	8 6	9 22	8 9	8 19	21 3	8 47	22 3	2 43	16 4	3 17																																		
S.	3	10 27	9 51	9 0	10 18	9 2	9 14	23 3	9 38	24 2	3 48	18 2	4 17																																		
M.	4	11 21	10 43	9 5	11 7	9 8	10 0	25 2	10 22	26 0	4 45	20 0	5 11																																		
Tu.	5	morn.	11 30	9 10	11 52	10 11	10 43	26 8	11 4	27 4	5 34	21 7	5 56																																		
W.	6	0 16	—	—	0 15	10 3	11 26	27 11	11 48	28 3	6 17	22 8	6 39																																		
Th.	7	1 12	0 37	10 4	1 0	10 5	—	—	0 11	28 5	7 2	23 2	7 24																																		
F.	8	2 7	1 24	10 5	1 46	10 5	0 34	28 5	0 56	28 3	7 46	22 11	8 8																																		
S.	9	3 3	2 7	10 4	2 27	10 2	1 18	27 9	1 38	27 0	8 29	22 0	8 52																																		
S.	10	4 0	2 49	10 0	3 12	9 9	2 0	26 4	2 23	25 4	9 14	20 7	9 36																																		
M.	11	4 57	3 35	9 6	3 59	9 3	2 45	24 5	3 10	23 5	9 58	18 10	10 23																																		
Tu.	12	5 53	4 26	9 0	4 55	8 9	3 37	22 4	4 9	21 5	10 49	17 0	11 16																																		
W.	13	6 47	5 28	8 6	6 6	8 4	4 46	20 7	5 28	20 3	11 50	15 8	—																																		
Th.	14	7 40	6 47	8 2	7 29	8 2	6 14	20 1	6 59	20 3	0 29	15 5	1 14																																		
F.	15	8 30	8 11	8 3	8 47	8 5	7 39	20 8	8 16	21 2	2 0	15 9	2 40																																		
S.	16	9 18	9 20	8 7	9 49	8 9	8 45	21 9	9 12	22 5	3 15	16 10	3 46																																		
S.	17	10 3	10 14	8 11	10 35	9 0	9 34	23 1	9 54	23 8	4 13	18 2	4 37																																		
M.	18	10 48	10 55	9 2	11 14	9 3	10 12	24 2	10 29	24 7	4 58	19 3	5 13																																		
Tu.	19	11 31	11 33	9 4	11 52	9 5	10 47	24 11	11 4	25 2	5 38	20 0	5 56																																		
W.	20	0 13	—	—	0 9	9 6	11 21	25 5	11 37	25 7	6 12	20 6	6 28																																		
Th.	21	0 56	0 25	9 7	0 41	9 7	11 52	25 7	—	—	6 43	20 8	6 58																																		
F.	22	1 39	0 57	9 7	1 13	9 7	0 8	25 7	0 24	25 5	7 14	20 6	7 29																																		
S.	23	2 23	1 28	9 7	1 43	9 6	0 39	25 3	0 54	25 0	7 43	20 1	7 59																																		
S.	24	3 8	1 58	9 5	2 13	9 4	1 9	24 7	1 24	24 2	8 15	19 5	8 31																																		
M.	25	3 56	2 29	9 3	2 45	9 1	1 39	23 8	1 55	23 1	8 47	18 7	9 4																																		
Tu.	26	4 44	3 2	9 0	3 21	8 10	2 12	22 7	2 31	21 11	9 22	17 6	9 40																																		
W.	27	5 34	3 41	8 8	4 5	8 7	2 52	21 4	3 16	20 8	10 2	16 5	10 26																																		
Th.	28	6 26	4 31	8 5	5 3	8 3	3 45	20 1	4 18	19 6	10 52	15 3	11 24																																		
F.	29	7 18	5 38	8 2	6 18	8 1	4 58	19 4	5 42	19 5	—	—	0 1																																		
S.	30	8 11	7 0	8 1	7 41	8 3	6 29	19 10	7 11	20 6	0 41	15 2	1 27																																		
Half Mean Spring Range.			4 ^{ft.} 10 ^{in.}				13 ^{ft.} 0 ^{in.}				10 ^{ft.} 6 ^{in.}																																				
Phases of the Moon.																								Moon's Declination at Noon.																							
D. H. M.																								M.D. ° ' M.D. ° ' M.D. ° ' M.D. ° '																							
Full - - - - - 5 1 52 Afternoon.																								1 17 8.33 9 13 N.33 17 8 N.24 25 1																							
Last Quarter - 12 4 57 Morning.																								2 15 29 10 16 20 18 4 45 26 1																							
New - - - - - 19 10 46 Afternoon.																								3 12 26 11 18 4 19 0 57 27 1																							
First Quarter - 28 2 47 Morning.																								4 8 33 12 18 41 20 2 8.52 28 1																							
																								5 4 4 13 18 14 21 6 32 29 1																							
In Perigee - - 6 9 0 Afternoon.																								6 0 N.43 14 16 50 22 9 56 30 1																							
In Apogee - - 22 4 0 Morning.																								7 5 28 15 14 36 23 12 56 30 1																							
																								8 9 51 16 11 44 24 15 25 30 1																							

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROK add 20 m.

SEPTEMBER, 1865.

WESTON-SUPER-MARE.								HOLYHEAD.								KINGSTOWN.								C's AGE AT NOON.
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	Time. H. M. F. I.	Height.	D.						
1 55 27 11		2 36 28 8		6 5 12 5		6 42 12 10		6 52 8 9		7 28 9 0		11.2												
3 16 29 9		3 52 31 1		7 15 13 3		7 43 13 9		8 3 9 4		8 34 9 7		12.2												
4 26 32 7		4 57 34 1		8 10 14 4		8 34 14 11		9 4 9 11		9 31 10 3		13.2												
5 26 35 7		5 52 37 0		8 56 15 6		9 17 16 0		9 55 10 7		10 16 10 11		14.2												
6 15 38 2		6 38 39 1		9 37 16 6		9 57 16 11		10 34 11 2		10 54 11 5		○												
7 1 39 10		7 23 40 6		10 17 17 2		10 36 17 4		11 15 11 8		11 36 11 8		16.2												
7 46 40 9		8 8 40 9		10 57 17 5		11 19 17 5		11 59 11 8		— —		17.2												
8 29 40 7		8 49 40 1		11 42 17 3		— —		0 23 11 8		0 46 11 7		18.2												
9 9 39 3		9 29 38 4		0 6 17 0		0 28 16 7		1 9 11 5		1 31 11 2		19.2												
9 49 37 0		10 8 35 7		0 53 16 2		1 18 15 7		1 54 10 10		2 18 10 7		20.2												
10 27 34 1		10 50 32 6		1 43 15 0		2 11 14 5		2 43 10 3		3 10 9 11		21.2												
11 16 31 0		11 48 29 9		2 41 13 10		3 15 13 4		3 39 9 7		4 14 9 3		☾												
— —		0 26 28 11		3 54 12 11		4 37 12 8		4 52 9 0		5 30 8 10		23.2												
1 6 28 6		1 50 28 7		5 20 12 7		6 0 12 9		6 9 8 10		6 47 8 11		24.2												
2 33 29 0		3 13 29 8		6 38 12 11		7 12 13 2		7 25 9 1		8 0 9 3		25.2												
3 50 30 6		4 24 31 5		7 41 13 6		8 8 13 11		8 32 9 6		9 1 9 8		26.2												
4 53 32 6		5 18 33 5		8 30 14 3		8 49 14 7		9 27 9 11		9 49 10 1		27.2												
5 39 34 3		5 59 35 0		9 7 14 11		9 23 15 2		10 7 10 3		10 22 10 5		28.2												
6 19 35 7		6 38 36 0		9 40 15 5		9 57 15 7		10 38 10 7		10 54 10 9		●												
6 55 36 3		7 11 36 7		10 12 15 8		10 27 15 9		11 9 10 10		11 25 10 10		0.6												
7 27 36 8		7 42 36 7		10 40 15 9		10 54 15 8		11 40 10 10		11 56 10 9		1.6												
7 57 36 6		8 12 36 3		11 9 15 7		11 24 15 6		— —		0 12 10 8		2.6												
8 26 36 0		8 40 35 6		11 40 15 4		11 57 15 1		0 28 10 7		0 44 10 6		3.6												
8 54 35 1		9 9 34 6		— —		0 14 14 10		1 0 10 4		1 16 10 2		4.6												
9 23 33 9		9 38 32 11		0 32 14 7		0 50 14 3		1 33 10 0		1 50 9 10		5.6												
9 53 32 0		10 9 31 0		1 9 13 11		1 31 13 6		2 9 9 7		2 30 9 5		6.6												
10 29 30 0		10 53 29 1		1 54 13 2		2 20 12 9		2 52 9 3		3 18 9 0		7.6												
11 23 28 3		11 58 27 10		2 50 12 6		3 26 12 3		3 49 8 10		4 24 8 8		☽												
— —		0 37 27 9		4 7 12 2		4 50 12 3		5 2 8 7		5 41 8 7		9.6												
1 20 28 1		2 2 28 10		5 32 12 6		6 11 12 10		6 20 8 9		6 58 9 0		10.6												
Mean Spring } 18ft. 7in. Range.				8ft. 0in.				5ft. 6in.																

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
0 11		9	2 50		17	5 38		25	8 25	
0 30		10	3 11		18	5 59		26	8 45	
0 50		11	3 32		19	6 20		27	9 5	
1 9		12	3 53		20	6 41		28	9 25	
1 29		13	4 14		21	7 2		29	9 45	
1 49		14	4 35		22	7 23		30	10 4	
2 9		15	4 56		23	7 44				
2 30		16	5 17		24	8 4				

s of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

TIDE TABLES FOR THE

SEPTEMBER, 1865.

WEEK DAY.		MONTH DAY.		MOON'S TRANSIT.		BELFAST.				LONDONDERRY.				SLIGO BAY.													
						MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.											
						Time. Height.		Time. Height.		Time. Height.		Time. Height.		Time. Height.		Time. Height.											
		H. M.		H. M. F. L.		H. M. F. L.		H. M. F. L.		H. M. F. L.		H. M. F. L.		H. M. F. L.		H. M. F. L.											
F.	1	8a37	6 36	7 11	7 15	8 0	4 9	5 10	4 41	6 7	1 10	8 2	1 48	8 1													
S.	2	9 32	7 49	8 2	8 17	8 5	5 8	6 4	5 31	6 7	2 22	8 10	2 49	9 8													
S.	3	10 27	8 43	8 9	9 8	9 0	5 55	6 10	6 18	7 2	3 14	9 9	3 36	10 8													
M.	4	11 21	9 31	9 3	9 53	9 6	6 42	7 6	7 5	7 9	3 57	10 8	4 18	11 5													
Tu.	5	morn.	10 13	9 8	10 33	9 10	7 27	8 0	7 48	8 2	4 39	11 6	5 11	11 28													
W.	6	0 16	10 54	9 11	11 14	9 11	8 7	8 5	8 27	8 6	5 23	12 1	5 44	12 8													
Th.	7	1 12	11 36	9 11	11 58	9 11	8 48	8 6	9 9	8 5	6 6	12 3	6 28	12 11													
F.	8	2 7	—	—	0 21	9 11	9 30	8 3	9 50	8 1	6 51	12 0	7 13	11 5													
S.	9	3 3	0 44	9 10	1 6	9 8	10 10	7 10	10 33	7 7	7 34	11 4	7 56	10 18													
S.	10	4 0	1 31	9 6	1 57	9 4	10 56	7 3	11 25	6 11	8 19	10 6	8 44	10 1													
M.	11	4 57	2 24	9 1	2 53	8 10	11 59	6 6	—	—	9 14	9 7	9 48	9 5													
Tu.	12	5 53	3 23	8 7	3 56	8 5	0 38	6 1	1 19	5 10	10 24	8 10	11 3	8													
W.	13	6 47	4 33	8 3	5 11	8 1	2 5	5 8	2 48	5 8	11 44	8 5	—	—													
Th.	14	7 40	5 50	8 0	6 31	8 0	3 28	5 10	4 4	6 0	0 25	8 4	1 5	8													
F.	15	8 30	7 11	8 0	7 46	8 2	4 37	6 2	5 5	6 4	1 44	8 6	2 19	8													
S.	16	9 18	8 15	8 4	8 42	8 7	5 29	6 5	5 52	6 7	2 47	9 1	3 13	9													
S.	17	10 3	9 4	8 9	9 24	8 11	6 14	6 10	6 35	7 0	3 34	9 8	3 52	10													
M.	18	10 48	9 43	9 1	10 0	9 2	6 54	7 2	7 12	7 3	4 9	10 4	4 26	10													
Tu.	19	11 31	10 16	9 3	10 33	9 4	7 30	7 4	7 47	7 6	4 43	10 9	5 11	10													
W.	20	0a13	10 48	9 4	11 3	9 4	8 2	7 7	8 17	7 7	5 18	11 0	5 34	11													
Th.	21	0 56	11 18	9 4	11 32	9 4	8 31	7 7	8 45	7 6	5 48	11 1	6 21	11													
F.	22	1 39	11 47	9 3	—	—	8 59	7 5	9 13	7 4	6 17	10 11	6 33	10													
S.	23	2 23	0 3	9 3	0 19	9 2	9 27	7 2	9 41	7 0	6 48	10 7	7 4	10													
S.	24	3 8	0 36	9 1	0 52	9 0	9 56	6 10	10 12	6 8	7 19	10 1	7 35	9													
M.	25	3 56	1 10	8 11	1 29	8 10	10 28	6 6	10 48	6 3	7 51	9 6	8 10	9													
Tu.	26	4 44	1 50	8 8	2 12	8 7	11 14	6 0	11 42	5 9	8 32	8 11	8 56	8													
W.	27	5 34	2 35	8 5	3 2	8 3	—	—	0 16	5 6	9 26	8 4	9 58	8													
Th.	28	6 26	3 32	8 1	4 5	8 0	0 52	5 5	1 35	5 4	10 35	8 0	11 15	8													
F.	29	7 18	4 43	7 11	5 23	7 11	2 19	5 4	3 0	5 6	11 56	8 1	—	—													
S.	30	8 11	6 3	7 11	6 43	8 0	3 38	5 9	4 13	6 1	0 36	8 3	1 15	8													
Half Mean Spring } Range.						4ft. 9in.						3ft. 10in.						5ft. 7in.									
Phases of the Moon.														Moon's Declination at Noon.													
D. H. M.														M.D. ° '													
Full - - - - 5 1 52 Afternoon.														1 17 8.33 9 13 N.33 17 8 N.24 25 17 S.24													
Last Quarter - 12 4 57 Morning.														2 15 29 10 16 20 18 4 45 26 18 24													
New - - - - 19 10 46 Afternoon.														3 12 26 11 18 4 19 0 57 27 18 30													
First Quarter 28 2 47 Morning.														4 8 33 12 18 41 20 2 S.52 28 17 52													
In Perigee - - 6 9 0 Afternoon.														5 4 4 13 18 14 21 6 32 29 16 17													
In Apogee - - 22 4 0 Morning.														6 0 N.43 14 16 50 22 9 56 30 13 4													
														7 5 28 15 14 36 23 12 56													
														8 9 51 16 11 44 24 15 25													

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—
 BELFAST subtract 2m. LONDONDERRY add 6m. SLIGO BAY add 9m.

SEPTEMBER, 1865.

MONTH DAY.	GALWAY.								QUEENSTOWN.								WATERFORD.								C's AGE AT NOON.
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
	Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			
1	0 22 10 7				1 0 11 0				0 20 8 11				1 0 9 2				0 33 9 7				1 11 9 10				11.2
2	1 33 11 6				2 0 12 2				1 40 9 6				2 13 9 10				1 48 10 3				2 23 10 8				12.2
3	2 28 12 9				2 53 13 5				2 43 10 4				3 11 10 9				2 56 11 1				3 26 11 6				13.2
4	3 17 14 0				3 39 14 7				3 37 11 3				4 1 11 8				3 55 12 0				4 21 12 5				14.2
5	4 0 15 2				4 21 15 8				4 23 12 0				4 44 12 4				4 45 12 9				5 7 13 0				15.2
6	4 41 16 1				5 2 16 4				5 6 12 7				5 29 12 9				5 28 13 3				5 49 13 5				16.2
7	5 25 16 5				5 49 16 5				5 53 12 10				6 16 12 10				6 13 13 6				6 37 13 6				17.2
8	6 12 16 3				6 34 15 11				6 38 12 9				7 0 12 7				6 59 13 6				7 20 13 4				18.2
9	6 56 15 6				7 19 15 0				7 21 12 3				7 43 11 11				7 40 13 1				8 1 12 10				19.2
10	7 43 14 5				8 8 13 9				8 5 11 6				8 25 11 1				8 23 12 6				8 44 12 1				20.2
11	8 35 13 0				9 4 12 3				8 49 10 7				9 15 10 2				9 5 11 8				9 29 11 2				21.2
12	9 35 11 7				10 12 11 2				9 41 9 9				10 12 9 5				9 58 10 9				10 35 10 4				22.2
13	10 52 10 11				11 35 10 10				10 51 9 2				11 32 9 1				11 12 10 0				11 50 9 10				23.2
14	— —				0 17 10 11				— —				0 15 9 1				— —				0 28 9 10				24.2
15	0 56 11 2				1 30 11 6				0 57 9 3				1 37 9 5				1 7 10 0				1 45 10 2				25.2
16	1 58 11 10				2 25 12 3				2 11 9 8				2 41 10 0				2 21 10 5				2 54 10 9				26.2
17	2 49 12 8				3 11 13 1				3 7 10 3				3 29 10 7				3 22 11 1				3 47 11 4				27.2
18	3 29 13 5				3 46 13 8				3 49 10 10				4 8 11 0				4 8 11 7				4 29 11 9				28.2
19	4 3 14 0				4 20 14 3				4 26 11 3				4 44 11 5				4 49 11 11				5 7 12 0				29.2
20	4 35 14 5				4 51 14 6				5 1 11 6				5 17 11 7				5 23 12 1				5 38 12 2				30.2
21	5 6 14 7				5 22 14 6				5 33 11 7				5 49 11 7				5 54 12 3				6 10 12 3				31.2
22	5 38 14 5				5 54 14 3				6 5 11 6				6 20 11 5				6 26 12 2				6 41 12 2				32.2
23	6 9 14 1				6 25 13 10				6 35 11 4				6 51 11 2				6 57 12 1				7 12 11 11				33.2
24	6 41 13 7				6 58 13 3				7 6 10 11				7 22 10 9				7 27 11 10				7 42 11 8				34.2
25	7 15 12 11				7 34 12 6				7 38 10 6				7 55 10 3				7 57 11 6				8 13 11 3				35.2
26	7 56 12 1				8 18 11 7				8 12 10 0				8 31 9 8				8 30 11 0				8 47 10 9				36.2
27	8 43 11 1				9 11 10 8				8 54 9 5				9 18 9 2				9 8 10 5				9 34 10 2				37.2
28	9 44 10 5				10 23 10 4				9 47 8 11				10 22 8 10				10 7 9 10				10 44 9 8				38.2
29	11 5 10 5				11 48 10 8				11 3 8 10				11 46 8 11				11 23 9 7				— —				39.2
30	— —				0 28 11 1				— —				0 27 9 2				0 1 9 8				0 39 9 11				40.2
Mean Spring Range.		7ft. 5in.				5ft. 10in.						6ft. 2in.													

Equation of Time at Noon.

M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.
0 11		9	2 50		17	5 38		25	8 25		
0 30		10	3 11		18	5 59		26	8 45		
0 50		11	3 32		19	6 20		27	9 5		
1 9		12	3 53		20	6 41		28	9 25		
1 29		13	4 14		21	7 2		29	9 45		
1 49		14	4 35		22	7 23		30	10 4		
2 9		15	4 56		23	7 44					
2 30		16	5 17		24	8 4					

mes of High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

TIDE TABLES FOR THE

OCTOBER, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSHIT.	BREST.				DEVONPORT.				PORTSMOUTH.																						
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.																				
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																			
		H. M.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.	H. M.	P. I.																	
	1	9 25	0 6	14 8	0 38	15 5	1 30	12 4	2 10	13 5	7 54	10 6	8 28	11 7																			
M.	2	9 59	1 9	16 5	1 35	17 5	2 44	13 4	3 17	14 6	9 0	11 6	9 29	12 6																			
Tu.	3	10 54	1 59	18 5	2 19	19 4	3 45	14 6	4 12	15 6	9 54	12 6	10 14	12 10																			
W.	4	11 50	2 41	20 2	3 42	20 9	4 37	15 6	5 2	16 4	10 37	13 2	11 0	13 6																			
Th.	5	morn.	3 26	21 2	3 49	21 5	5 25	16 3	5 48	16 9	11 22	13 8	11 45	13 10																			
F.	6	0 47	4 12	21 6	4 34	21 5	6 12	16 7	6 36	16 10	—	—	0 9	13 10																			
S.	7	1 46	4 56	21 2	5 18	20 9	6 55	16 7	7 16	16 5	0 33	13 9	0 56	13 8																			
	8	2 45	5 41	20 1	6 5	19 6	7 39	16 2	8 2	15 9	1 19	13 5	1 43	13 8																			
M.	9	3 43	6 29	18 7	6 52	17 7	8 24	15 6	8 46	14 10	2 6	12 10	2 30	12 4																			
Tu.	10	4 40	7 17	16 7	7 44	15 8	9 8	14 7	9 30	13 9	2 53	12 0	3 17	12 7																			
W.	11	5 35	8 13	14 9	8 44	14 2	9 54	13 7	10 23	12 8	3 42	11 2	4 10	10 8																			
Th.	12	6 26	9 22	13 8	10 3	13 6	10 53	12 9	11 28	12 0	4 40	10 4	5 15	10 6																			
F.	13	7 15	10 46	13 6	11 29	13 8	—	—	0 9	12 6	5 55	9 10	6 35	9 10																			
S.	14	8 2	—	—	0 6	14 0	0 49	12 0	1 29	12 10	7 16	10 0	7 53	10 2																			
	15	8 46	0 38	14 7	1 6	15 2	2 6	12 5	2 37	13 5	8 28	10 7	8 57	10 10																			
M.	16	9 29	1 31	15 9	1 51	16 4	3 6	13 3	3 30	14 1	9 23	11 2	9 45	11 4																			
Tu.	17	10 12	2 10	16 10	2 27	17 4	3 54	13 11	4 16	14 7	10 5	11 8	10 23	11 10																			
W.	18	10 54	2 44	17 9	3 1	18 1	4 36	14 5	4 55	14 11	10 40	12 0	10 57	12 1																			
Th.	19	11 37	3 16	18 3	3 31	18 3	5 12	14 10	5 28	15 11	11 12	12 3	11 27	12 4																			
F.	20	0 21	3 47	18 5	4 4	18 6	5 44	15 0	5 59	15 0	11 44	12 4	—	—																			
S.	21	1 6	4 20	18 5	4 35	18 4	6 16	15 0	6 32	14 11	0 1	12 4	0 18	12 8																			
	22	1 53	4 50	18 2	5 6	17 11	6 45	14 10	6 59	14 7	0 35	12 2	0 51	12 8																			
M.	23	2 41	5 22	17 7	5 39	17 4	7 14	14 6	7 29	14 1	1 7	12 0	1 23	12 10																			
Tu.	24	3 30	5 57	16 11	6 16	16 5	7 46	14 1	8 2	13 6	1 40	11 9	1 58	12 7																			
W.	25	4 20	6 35	15 11	6 58	15 5	8 19	13 7	8 37	12 11	2 18	11 5	2 37	12 8																			
Th.	26	5 11	7 22	14 11	7 47	14 4	8 58	13 2	9 22	12 4	2 58	11 0	3 21	10 8																			
F.	27	6 2	8 15	14 0	8 49	13 9	9 49	12 8	10 20	11 11	3 44	10 6	4 12	10 6																			
S.	28	6 53	9 27	13 9	10 9	14 0	10 53	12 5	11 33	11 11	4 44	10 2	5 20	10 1																			
	29	7 45	10 50	14 4	11 29	14 10	—	—	0 18	12 9	6 0	10 1	6 39	10 1																			
M.	30	8 38	—	—	0 4	15 7	0 58	12 6	1 38	13 6	7 16	10 7	7 53	11 1																			
Tu.	31	9 32	0 35	16 4	1 5	17 3	2 16	13 6	2 47	14 7	8 26	11 6	8 57	12 6																			
Half Mean Spring Range.			9 ft. 6 in.				7 ft. 9 in.				6 ft. 4 in.																						
Phases of the Moon.																	Moon's Declination at Noon.																
D. H. M.																	M.D. 0 1																
Full - - - - - 4 10 31 Afternoon.																	1 10 8.15 9 18 N. 31 17 18.55 25 18 5.1																
Last Quarter - 11 3 22 Afternoon.																	2 6 6 10 18 22 18 5 37 20 16 5																
New - - - - - 19 4 27 Afternoon.																	3 1 28 11 17 11 19 9 6 27 14 5																
First Quarter - 27 3 50 Afternoon.																	4 3 N. 21 12 15 8 20 12 13 28 11 3																
																	5 7 59 13 12 25 21 14 51 29 7 4																
																	6 12 5 14 9 11 22 16 52 30 3 2																
In Perigee - - 5 6 0 Morning.																	7 15 21 15 5 37 23 18 9 31 1 11																
In Apogee - - 19 7 0 Morning.																	8 17 31 16 1 52 24 18 37																

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 Brest add 18 m. Devonport add 17 m. Portsmouth add 4 m.

OCTOBER, 1865.

MONTH DAY.	DOVER.								SHEERNESS.								LONDON.								AGE AT NOON.		
	MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.						
	Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.			Time. H. M. F. I.	Height.					
1	7 20 15 3	7	53	16	0	9 7 13 5	9	43	13	11	10 32 15 11	11	10 16 4	11	6												
2	8 24 16 9	8	52	17	6	10 14 14 4	10	43	14	11	11 45 16 10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12
3	9 17 18 3	9	40	18	11	11 9 15 5	11	32	15	11	0 12 17 5	0	36	18	0	13	6									13	
4	10 4 19 6	10	28	20	0	11 52 16 5	—	—	—	—	0 59 18 7	1	23	19	2	15	6									14	
5	10 53 20 4	11	18	20	6	0 14 16 9	0	37	17	1	1 45 19 7	2	7	20	0	16	6									15	
6	11 43 20 7	—	—	—	—	0 59 17 4	1	22	17	6	2 28 20 4	2	50	20	7	16	6									16	
7	0 7 20 7	0	31	20	5	1 45 17 6	2	6	17	4	3 12 20 8	3	35	20	8	17	6									17	
8	0 56 20 1	1	21	19	8	2 27 17 3	2	49	17	1	3 58 20 6	4	20	20	3	18	6									18	
9	1 46 19 3	2	10	18	7	3 11 16 7	3	35	16	2	4 43 19 11	5	5	19	6	19	6									19	
10	2 34 17 10	2	58	17	1	3 59 15 8	4	23	15	1	5 29 18 11	5	53	18	4	20	6									20	
11	3 23 16 5	3	50	15	8	4 48 14 7	5	16	14	1	6 19 17 9	6	46	17	3	21	6									21	
12	4 18 14 11	4	50	14	5	5 48 13 8	6	22	13	3	7 15 16 8	7	51	16	3	22	6									22	
13	5 26 14 2	6	3	14	2	7 2 13 0	7	45	12	11	8 32 15 11	9	13	15	9	23	6									23	
14	6 42 14 5	7	19	14	9	8 27 13 0	9	7	13	3	9 54 15 8	10	34	15	9	24	6									24	
15	7 53 15 3	8	22	15	9	9 43 13 7	10	14	13	10	11 11 15 11	11	42	16	3	25	6									25	
16	8 46 16 2	9	8	16	7	10 41 14 3	11	5	14	6	—	—	0 10 16	7	26	6										26	
17	9 28 16 11	9	47	17	3	11 24 14 9	11	42	15	0	0 32 16 11	0	52	17	4	27	6									27	
18	10 7 17 6	10	25	17	9	11 59 15 3	—	—	—	1	13 17 8	1	31	17	11	28	6									28	
19	10 41 17 11	10	59	18	1	0 17 15 5	0	34	15	7	1 48 18 2	2	2	18	4	29	6									29	
20	11 17 18 2	11	34	18	2	0 49 15 8	1	4	15	9	2 19 18 6	2	35	18	8	30	6									30	
21	11 52 18 1	—	—	—	1	20 15 10	1	36	15	9	2 50 18 9	3	6	18	10	31	6									31	
22	0 9 18 1	0	26	18	0	1 52 15 8	2	7	15	7	3 23 18 9	3	38	18	9	32	6									32	
23	0 44 17 10	1	1	17	7	2 22 15 6	2	37	15	5	3 53 18 8	4	8	18	6	33	6									33	
24	1 19 17 5	1	38	17	2	2 52 15 3	3	9	15	0	4 23 18 4	4	39	18	2	34	6									34	
25	1 58 16 10	2	18	16	5	3 27 14 9	3	46	14	6	4 57 17 11	5	15	17	7	35	6									35	
26	2 39 16 1	3	2	15	9	4 6 14 2	4	28	13	11	5 35 17 4	5	56	17	0	36	6									36	
27	3 25 15 4	3	52	14	11	4 53 13 8	5	19	13	5	6 21 16 9	6	47	16	5	37	6									37	
28	4 22 14 7	4	55	14	6	5 50 13 2	6	28	13	0	7 18 16 3	7	54	16	0	38	6									38	
29	5 30 14 7	6	5	14	10	7 7 13 1	7	51	13	3	8 34 16 0	8	17	16	0	39	6									39	
30	6 42 15 5	7	19	16	0	8 30 13 6	8	7	13	11	9 58 16 2	10	35	16	6	40	6									40	
31	7 51 16 9	8	20	17	5	9 41 14 5	9	11	14	11	11 11 16 11	11	40	17	5	41	6									41	
Half Mean Spring } 9ft. 4in. Range.								8ft. 0in.								9ft. 7in.											

Equation of Time at Noon.

D.	M.	S.	Add.	M.	D.	S.	Add.	M.	D.	S.	Add.	M.	D.	S.	Add.
1	10	24		9	12	45		17	14	37		25	15	50	
2	10	43		10	13	1		18	14	49		26	15	56	
3	11	1		11	13	16		19	14	59		27	16	2	
4	11	20		12	13	31		20	15	9		28	16	6	
5	11	37		13	13	46		21	15	19		29	16	10	
6	11	55		14	13	59		22	15	28		30	16	13	
7	12	12		15	14	13		23	15	36		31	16	16	
8	12	29		16	14	25		24	15	43					

times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required,—for
DOVER subtract 5 m. | SHEERNESS subtract 8 m. | LONDON 0 m.

OCTOBER, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.								HULL.								SUNDERLAND.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
		H. M.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.		
S.	1	9 25	8 15 9 11	8 50 10 2	2 37 16 8	3 11 17 6	—	—	0 3 11 1																	
M.	2	9 59	9 21 10 6	9 52 10 11	3 43 18 3	4 12 19 1	0 33 12 3	1 2 12 11																		
Tu.	3	10 54	10 20 11 3	10 43 11 7	4 38 19 11	5 0 20 8	1 30 13 5	1 55 14 1																		
W.	4	11 50	11 5 11 11	11 27 12 2	5 20 21 4	5 43 21 10	2 17 14 6	2 39 14 11																		
Th.	5	morn.	11 50 12 4	—	—	—	—	—																		
F.	6	0 47	0 12 12 5	0 34 12 6	6 53 22 11	7 17 23 0	3 44 15 10	4 0 15 17																		
S.	7	1 46	0 57 12 5	1 20 12 4	7 39 22 11	8 1 22 9	4 28 15 10	4 50 15 0																		
S.	8	2 45	1 42 12 3	2 5 12 0	8 23 22 4	8 47 21 9	5 13 15 4	5 37 14 10																		
M.	9	3 43	2 29 11 9	2 53 11 6	9 11 21 1	9 35 20 3	6 2 14 4	6 27 13 9																		
Tu.	10	4 40	3 17 11 2	3 40 10 10	9 58 19 6	10 24 18 8	6 53 13 3	7 20 12 1																		
W.	11	5 35	4 3 10 6	4 29 10 3	10 55 18 0	11 30 17 3	7 48 12 2	8 20 11 0																		
Th.	12	6 26	4 59 10 0	5 30 9 9	—	—	—	—																		
F.	13	7 15	6 8 9 8	6 53 9 7	0 45 16 3	1 23 16 1	10 14 10 10	10 53 10 10																		
S.	14	8 2	7 35 9 8	8 15 9 9	2 1 16 2	2 37 16 7	11 30 11 0	—																		
S.	15	8 46	8 50 9 11	9 21 10 2	3 11 17 0	3 43 17 6	0 3 11 4	0 33 11 0																		
M.	16	9 29	9 49 10 5	10 15 10 7	4 10 18 0	4 34 18 6	1 0 12 1	1 24 12 1																		
Tu.	17	10 12	10 35 10 10	10 54 11 0	4 53 18 11	5 11 19 3	1 46 12 9	2 6 13 0																		
W.	18	10 54	11 12 11 2	11 30 11 3	5 28 19 7	5 46 19 10	2 24 13 3	2 42 13 1																		
Th.	19	11 47	11 47 11 4	—	—	—	—	—																		
F.	20	0 21	0 2 11 5	0 17 11 5	6 35 20 3	6 52 20 4	3 27 13 11	3 43 14 0																		
S.	21	1 6	0 33 11 5	0 49 11 4	7 8 20 4	7 24 20 3	3 58 14 1	4 14 14 0																		
S.	22	1 53	1 5 11 3	1 21 11 2	7 40 20 2	7 55 20 1	4 30 13 11	4 45 13 0																		
M.	23	2 41	1 30 11 1	1 52 11 0	8 11 19 10	8 27 19 7	5 1 13 7	5 17 13 0																		
Tu.	24	3 30	2 9 10 10	2 27 10 8	8 44 19 3	9 3 18 10	5 35 13 1	5 54 13 0																		
W.	25	4 20	2 45 10 7	3 4 10 5	9 23 18 5	9 42 18 0	6 15 12 6	6 36 13 0																		
Th.	26	5 11	3 23 10 3	3 44 10 1	10 4 17 7	10 30 17 3	7 0 11 11	7 25 11 0																		
F.	27	6 2	4 7 9 11	4 33 9 10	11 0 16 10	11 34 16 6	7 52 11 4	8 22 11 0																		
S.	28	6 53	5 1 9 9	5 35 9 8	—	—	8 59 11 0	9 38 11 0																		
S.	29	7 45	6 13 8 8	6 59 9 10	0 50 16 3	1 27 16 6	10 19 11 1	10 56 11 0																		
M.	30	8 38	7 38 10 0	8 15 10 3	2 3 16 11	2 37 17 6	11 30 11 9	—																		
Tu.	31	9 32	8 48 10 7	9 18 10 11	3 9 18 4	3 40 19 1	0 1 12 3	0 30 12 10																		

Half Mean Spring }
Range. } 5 ft. 9 in.

10 ft. 5 in.

7 ft. 2 in.

Phases of the Moon.

	D.	H.	M.	
Full	4	10	31	Afternoon.
Last Quarter	11	3	22	Afternoon.
New	19	4	27	Afternoon.
First Quarter	27	3	50	Afternoon.
In Perigee	5	6	0	Morning.
In Apogee	19	7	0	Morning.

Moon's Declination at Noon.

M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
1	108	15	9	18	N. 31	17	18	55	25	18	11
2	6	6	10	18	22	18	5	37	26	16	51
3	1	28	11	17	11	19	9	6	27	14	31
4	3	N. 21	12	15	8	20	12	13	28	11	31
5	7	59	13	12	25	21	14	51	29	7	46
6	12	5	14	9	11	22	16	52	30	3	24
7	15	21	15	5	37	23	18	9	31	1	N. 11
8	17	31	16	1	52	24	18	37			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
HARWICH subtract 3 m. HULL add 1 m. SUNDERLAND add 3 m.

OCTOBER, 1865.

WIND DAY.	MONTU DAY.	NORTH SHIELDS.				LEITH.				THURSO.				C's AGE AT NOON.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	
	1	—	—	0 17 10	8	11 10 13	3	11 40 13	9	5 12 9	11	5 41 10	6	11.6
	2	0 45 11	2	1 13 11	8	—	—	0 7 14	5	6 9 11	2	6 32 11	11	12.6
	3	1 37 12	3	1 59 12	10	0 31 15	1	0 54 15	10	6 51 12	8	7 8 13	4	13.6
	4	2 19 13	4	2 40 13	10	1 15 16	6	1 37 17	0	7 27 14	0	7 47 14	5	○
	5	3 1 14	3	3 23 14	6	1 59 17	5	2 21 17	9	8 9 14	9	8 31 14	11	15.6
	6	3 45 14	8	4 8 14	9	2 42 17	11	3 4 17	11	8 53 14	11	9 15 14	9	16.6
	7	4 30 14	7	4 53 14	4	3 26 17	9	3 48 17	7	9 38 14	7	10 1 14	3	17.6
	8	5 17 14	1	5 41 13	8	4 11 17	3	4 35 16	9	10 26 13	8	10 51 13	2	18.6
	9	6 5 13	3	6 30 12	9	5 0 16	4	5 25 15	9	11 17 12	6	11 43 11	11	19.6
	10	6 55 12	2	7 23 11	7	5 51 15	1	6 19 14	5	—	—	0 11 11	3	20.6
	11	7 53 11	0	8 27 10	5	6 47 13	10	7 22 13	3	0 39 10	9	1 12 10	2	○
	12	9 3 10	1	9 46 9	10	7 57 12	10	8 38 12	6	1 48 9	9	2 30 9	5	22.6
	13	10 26 9	9	11 5 9	10	9 20 12	5	10 0 12	5	3 16 9	3	3 58 9	3	23.6
	14	11 43 10	1	—	—	10 37 12	7	11 10 12	10	4 38 9	4	5 12 9	6	24.6
	15	0 17 10	4	0 45 10	7	11 40 13	2	—	—	5 41 9	10	6 7 10	4	25.6
	16	1 11 10	11	1 33 11	2	0 5 13	7	0 27 14	0	6 28 10	9	6 45 11	3	26.6
	17	1 52 11	6	2 10 11	10	0 46 14	5	1 4 14	9	7 1 11	8	7 16 12	0	27.6
	18	2 27 12	2	2 43 12	4	1 22 15	1	1 40 15	5	7 31 12	4	7 45 12	7	28.6
	19	2 58 12	6	3 13 12	8	1 56 15	7	2 11 15	9	7 59 12	9	8 14 12	11	●
	20	3 28 12	9	3 44 12	10	2 26 15	11	2 41 15	11	8 29 12	11	8 44 12	10	0.8
	21	4 0 12	10	4 16 12	9	2 55 15	11	3 11 15	9	9 0 12	9	9 16 12	8	1.8
	22	4 32 12	8	4 48 12	6	3 27 15	8	3 43 15	6	9 32 12	6	9 49 12	3	2.8
	23	5 4 12	3	5 21 12	1	3 59 15	3	4 16 15	1	10 6 12	0	10 24 11	9	3.8
	24	5 39 11	11	5 58 11	8	4 34 14	10	4 52 14	7	10 44 11	5	11 5 11	1	4.8
	25	6 18 11	5	6 38 11	2	5 13 14	3	5 35 13	11	11 27 10	9	11 50 10	5	5.8
	26	7 2 10	10	7 29 10	6	5 59 13	7	6 24 13	3	—	—	0 10 10	2	6.8
	27	7 57 10	2	8 30 9	11	6 52 12	11	7 25 12	9	0 43 9	10	1 15 9	8	7.8
	28	9 9 9	10	9 51 9	11	8 3 12	7	8 43 12	6	1 54 9	6	2 35 9	6	8.8
	29	10 31 10	1	11 8 10	5	9 26 12	9	10 2 13	0	3 22 9	7	4 1 9	10	9.8
	30	11 44 10	10	—	—	10 37 13	5	11 8 13	11	4 38 10	1	5 10 10	6	10.8
	31	0 15 11	3	0 42 11	8	11 37 14	5	—	—	5 38 11	1	6 3 11	9	11.8

Half Mean Spring } 6ft. 8in.

8ft. 2in.

6ft. 7in.

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	10	24		9	12	45		17	14	37		25	15	50	
2	10	43		10	13	1		18	14	49		26	15	56	
3	11	1		11	13	16		19	14	59		27	16	2	
4	11	20		12	13	31		20	15	9		28	16	6	
5	11	37		13	13	46		21	15	19		29	16	10	
6	11	55		14	13	59		22	15	28		30	16	13	
7	12	12		15	14	13		23	15	36		31	16	16	
8	12	29		16	14	25		24	15	43					

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 NORTH SHIELDS add 0 m. | LEITH add 13 m. | THURSO add 14 m.

TIDE TABLES FOR THE

OCTOBER, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.								LIVERPOOL.								PEMBROKE.							
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.			
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.						
		H. M.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.	H. M. P. I.							
	1	9 45	8 18 8 6	8 50 8 9	7 46 21 4	8 17 22 3	2 9 16 4	2 44 17 3																		
M.	2	9 59	9 22 9 0	9 50 9 3	8 46 23 5	9 11 24 5	3 17 18 4	3 48 19 3																		
Tu.	3	10 54	10 14 9 6	10 37 9 9	9 33 25 6	9 53 26 4	4 14 20 3	4 39 21 2																		
W.	4	11 50	11 1 10 0	11 25 10 2	10 15 27 1	10 38 27 8	5 5 21 11	5 30 22 6																		
Th.	5	morn.	11 49 10 3	—	—	11 1 28 3	5 53 22 11	6 16 23 4																		
F.	6	0 47	0 13 10 5	0 37 10 6	11 48 28 8	—	6 40 23 5	7 20 24 1																		
S.	7	1 46	1 0 10 6	1 22 10 5	0 11 28 7	0 33 28 5	7 23 23 1	7 45 24 1																		
	8	2 45	1 45 10 4	2 8 10 2	0 56 27 11	1 19 27 1	8 8 22 0	8 33 21 5																		
M.	9	3 43	2 31 10 0	2 54 9 9	1 42 26 3	2 5 25 3	8 56 20 6	9 18 19 2																		
Tu.	10	4 40	3 16 9 6	3 40 9 3	2 28 24 3	2 51 23 3	9 40 18 8	10 4 17 12																		
W.	11	5 35	4 6 9 0	4 34 8 9	3 17 22 3	3 48 21 4	10 29 16 11	10 54 16 3																		
Th.	12	6 26	5 5 8 6	5 41 8 3	4 21 20 6	5 2 20 0	11 26 15 6	—																		
F.	13	7 15	6 21 8 1	7 1 8 1	5 46 19 9	6 30 19 10	0 3 15 3	0 43 15 1																		
S.	14	8 2	7 41 8 2	8 18 8 4	7 11 20 2	7 46 20 8	1 28 15 4	2 8 15 1																		
	15	8 46	8 50 8 6	9 19 8 8	8 17 21 4	8 44 22 0	2 43 16 4	3 14 17 1																		
M.	16	9 29	9 44 8 10	10 6 8 11	9 7 22 7	9 26 23 2	3 42 17 8	4 5 18 2																		
Tu.	17	10 12	10 25 9 1	10 44 9 2	9 44 23 9	10 0 24 1	4 27 18 9	4 47 19 2																		
W.	18	10 54	11 3 9 3	11 21 9 4	10 18 24 5	10 36 24 8	5 8 19 6	5 26 19 2																		
Th.	19	11 37	11 38 9 4	11 55 9 5	10 51 24 11	11 7 25 2	5 42 20 0	5 58 20 1																		
F.	20	0 21	—	0 12 9 6	11 23 25 3	11 40 25 3	6 14 20 4	6 31 20 3																		
S.	21	1 6	0 28 9 6	0 45 9 6	11 56 25 3	—	6 47 20 4	7 2 20 2																		
	22	1 53	1 1 9 6	1 17 9 6	0 13 25 2	0 28 25 0	7 17 20 0	7 33 19 10																		
M.	23	2 41	1 33 9 5	1 49 9 4	0 44 24 9	1 0 24 4	7 49 19 6	8 6 19 8																		
Tu.	24	3 30	2 5 9 3	2 23 9 2	1 16 23 11	1 33 23 5	8 25 18 10	8 44 18 4																		
W.	25	4 20	2 42 9 1	3 1 8 11	1 52 22 11	2 11 22 5	9 2 17 11	9 22 17 2																		
Th.	26	5 11	3 21 8 10	3 43 8 9	2 32 21 11	2 56 21 5	9 43 17 0	10 5 16 3																		
F.	27	6 2	4 9 8 7	4 36 8 6	3 20 20 10	3 50 20 5	10 30 16 1	10 58 15 1																		
S.	28	6 53	5 9 8 5	5 46 8 4	4 27 20 1	5 7 20 3	11 31 15 7	—																		
	29	7 45	6 26 8 3	7 4 8 4	5 52 20 4	6 34 20 10	0 7 15 9	0 47 16 6																		
M.	30	8 38	7 41 8 6	8 16 8 9	7 11 21 6	7 45 22 5	1 29 16 7	2 8 17 6																		
Tu.	31	9 32	8 48 9 0	9 18 9 3	8 14 23 4	8 41 24 4	2 42 18 2	3 14 19 2																		
Half Mean Spring Range.			4ft. 10in.		13ft. 0in.								10ft. 6in.													
Phases of the Moon.										Moon's Declination at Noon.																
D. H. M.										M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'					
Full - - - - - 4 10 31 Afternoon.										1	10	15	9	18	N. 31	17	18.	55	25	18	15					
Last Quarter - 11 3 22 Afternoon.										2	6	6	10	18	22	18	5	37	26	16	58					
New - - - - - 19 4 27 Afternoon.										3	1	28	11	17	11	19	9	6	27	14	50					
First Quarter - 27 3 50 Afternoon.										4	3	N. 21	12	15	8	20	12	13	28	11	15					
										5	7	59	13	13	25	21	14	51	29	7	49					
In Perigee - - 5 6 0 Morning.										6	12	5	14	9	11	22	16	52	30	3	39					
In Apogee - - 19 7 0 Morning.										7	15	21	15	5	37	23	18	9	31	1	N. 10					
										8	17	31	16	1	52	24	18	37								

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
 GREENOCK add 19 m. | LIVERPOOL add 12 m. | PEMBROKE add 20 m.

OCTOBER, 1865.

ESTON-SUPER-MARE.						HOLYHEAD.						KINGSTOWN.						C's Age AT NOON.						
MORNING.			AFTERNOON.			MORNING.			AFTERNOON.			MORNING.			AFTERNOON.									
10.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.		Time.	Height.								
M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	D.					
41	30	0	3	18	31	3	6	44	13	4	7	13	13	10	7	31	9	4	8	11	6			
54	32	9	4	27	34	4	7	41	14	6	8	7	15	1	8	34	10	0	9	3	10	4	12	6
55	36	0	5	21	37	5	8	29	15	8	8	48	16	3	9	28	10	8	9	48	11	0	13	6
46	38	7	6	11	39	7	9	10	16	9	9	32	17	3	10	8	11	3	10	29	11	6	0	
35	40	3	6	59	40	11	9	54	17	5	10	15	17	7	10	51	11	9	11	13	11	10	15	6
22	41	2	7	44	41	1	10	36	17	8	10	56	17	7	11	36	11	10	11	59	11	9	16	6
6	40	9	8	28	40	2	11	18	17	4	11	42	17	1	—	—	—	—	0	22	11	8	17	6
50	39	3	9	12	38	3	—	—	—	0	7	16	7	0	45	11	5	1	9	11	2	18	6	
32	36	10	9	51	35	4	0	33	16	2	0	59	15	6	1	34	10	10	1	59	10	6	19	6
10	33	10	10	31	32	5	1	25	14	11	1	52	14	4	2	24	10	2	2	51	9	10	20	6
56	30	10	11	25	29	8	2	20	13	9	2	53	13	3	3	19	9	7	3	52	9	3	0	
—	—	—	0	1	28	8	3	29	12	10	4	11	12	6	4	27	9	0	5	5	8	10	22	6
40	28	3	1	21	28	1	4	53	12	5	5	33	12	6	5	44	8	9	6	21	8	10	23	6
3	28	5	2	40	29	0	6	11	12	8	6	44	12	11	6	57	8	11	7	31	9	1	24	6
17	29	10	3	50	30	9	7	13	13	3	7	40	13	8	8	3	9	4	8	31	9	6	25	6
20	31	8	4	45	32	7	8	3	14	0	8	22	14	4	8	57	9	9	9	19	9	11	26	6
8	33	6	5	29	34	2	8	40	14	8	8	56	14	11	9	39	10	1	9	56	10	3	27	6
49	34	9	6	7	35	3	9	13	15	1	9	29	15	3	10	12	10	5	10	27	10	7	28	6
24	35	7	6	41	35	10	9	44	15	5	9	59	15	6	10	41	10	8	10	56	10	9	0	
58	36	0	7	15	36	3	10	14	15	7	10	28	15	7	11	12	10	9	11	28	10	9	0	8
31	36	2	7	46	36	0	10	43	15	6	10	57	15	5	11	44	10	8	12	0	10	7	1	8
1	35	10	8	16	35	7	11	12	15	3	11	29	15	1	—	—	—	0	16	10	6	2	8	
31	35	2	8	47	35	8	11	47	14	11	—	—	—	0	33	10	5	0	50	10	3	3	8	
3	34	2	9	20	33	5	0	5	14	8	0	26	14	5	1	8	10	1	1	27	9	11	4	8
36	32	8	9	53	31	10	0	47	14	1	1	9	13	9	1	47	9	9	2	8	9	7	5	8
12	31	1	10	32	30	3	1	32	13	6	1	57	13	3	2	31	9	5	2	56	9	3	6	8
57	29	6	11	29	29	0	2	24	12	11	2	56	12	8	3	22	9	1	3	55	8	11	0	
—	—	—	0	6	28	9	3	35	12	7	4	16	12	7	4	32	8	10	5	10	8	10	8	8
45	29	0	1	25	29	6	4	59	12	9	5	36	13	1	5	47	8	11	6	23	9	2	9	8
3	30	4	2	40	31	6	6	11	13	6	6	42	14	0	6	58	9	5	7	30	9	9	10	8
16	32	9	3	51	34	2	7	10	14	6	7	37	15	1	8	0	10	0	8	30	10	4	11	8
n Spring } 18ft. 7in. ge.						8ft. 0in.						5ft. 6in.												

Equation of Time at Noon.

S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
24		9	12	45		17	14	37		25	15	50	
43		10	13	1		18	14	49		26	15	56	
1		11	13	16		19	14	59		27	16	2	
20		12	13	31		20	15	9		28	16	6	
37		13	13	46		21	15	19		29	16	10	
55		14	13	59		22	15	28		30	16	13	
12		15	14	13		23	15	36		31	16	16	
29		16	14	25		24	15	43					

High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
-SUPER-MARE add 12 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

OCTOBER, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.																		
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.																
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.															
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.															
S.	1	9 25	7 18	■	2	7 48	8 5	4 41	6 5	5 5	6 8	1 50	8 10	2 20	9 1														
M.	2	9 59	8 16	8	9	8 41	9 0	5 28	7 0	5 51	7 3	2 47	9 9	3 11	10 1														
Tu.	3	10 54	9 4	9	4	9 24	9 7	6 14	7 7	6 36	7 10	3 31	10 9	3 49	11 1														
W.	4	11 50	9 46	9	9	10 8	9 11	6 58	8 1	7 21	8 4	4 12	11 8	4 35	12 1														
Th.	5	morn.	10 30	10	0	10 52	10 1	7 44	8 6	8 6	8 7	4 58	12 3	5 21	12 1														
F.	6	0 47	11 14	10	0	11 35	10 0	8 27	8 8	8 46	8 6	5 43	12 6	6 5	12 1														
S.	7	1 46	11 57	9	11	—	—	9 7	8 4	9 29	8 2	6 27	12 2	6 50	11 1														
S.	8	2 45	0 21	9	10	0 46	9 8	9 51	7 10	10 14	7 7	7 14	11 5	7 38	11 1														
M.	9	3 43	1 12	9	6	1 38	9 4	10 38	7 3	11 5	6 10	8 1	10 5	8 25	9 1														
Tu.	10	4 40	2 5	9	1	2 33	8 10	11 38	6 5	—	—	8 54	9 6	9 26	9 1														
W.	11	5 35	3 2	8	7	3 35	8 5	0 15	6 1	0 55	5 10	10 1	8 9	10 38	8 1														
Th.	12	6 26	4 8	8	3	4 46	8 1	1 39	5 8	2 23	5 7	11 19	8 3	11 58	8 1														
F.	13	7 15	5 24	8	0	6 3	7 11	3 3	5 8	3 39	5 10	—	—	0 37	8 1														
S.	14	8 2	6 43	8	0	7 18	8 1	4 12	6 0	4 40	6 2	1 16	8 4	1 50	8 1														
S.	15	8 46	7 48	■	2	8 14	8 4	5 4	6 4	5 26	6 6	2 20	8 10	2 45	9 1														
M.	16	9 29	8 36	8	7	8 56	8 9	5 47	6 8	6 6	6 10	3 7	9 5	3 25	9 1														
Tu.	17	10 12	9 15	8	11	9 32	9 1	6 25	7 0	6 43	7 1	3 42	10 0	3 58	10 1														
W.	18	10 54	9 49	9	2	10 5	9 3	7 1	7 3	7 18	7 4	4 15	10 6	4 32	10 1														
Th.	19	11 37	10 20	9	3	10 35	9 4	7 34	7 5	7 49	7 5	4 48	10 9	5 4	10 1														
F.	20	0 21	10 51	9	4	11 6	9 3	8 4	7 6	8 18	7 6	5 20	10 11	5 35	10 1														
S.	21	1 6	11 21	9	3	11 35	9 3	8 33	7 5	8 47	7 4	5 51	10 10	6 5	10 1														
S.	22	1 53	11 51	9	■	—	—	9 2	7 3	9 17	7 1	6 21	10 7	6 38	10 1														
M.	23	2 41	0 8	9	2	0 26	9 1	9 32	6 11	9 48	6 9	6 55	10 3	7 12	10 1														
Tu.	24	3 30	0 44	9	■	1 5	8 11	10 6	6 8	10 26	6 5	7 30	9 8	7 49	9 1														
W.	25	4 20	1 26	8	9	1 49	8 8	10 48	6 3	11 15	6 0	8 9	9 2	8 33	8 1														
Th.	26	5 11	2 14	8	6	2 40	8 5	11 47	5 9	—	—	9 1	8 8	9 31	8 1														
F.	27	6 2	3 6	8	3	3 37	8 2	0 22	5 7	1 1	5 6	10 5	8 4	10 44	8 1														
S.	28	6 53	4 14	8	1	4 51	8 1	1 46	5 6	2 28	5 7	11 24	8 4	—	—														
S.	29	7 45	5 29	8	1	6 6	8 2	3 7	5 10	3 41	6 2	■	3 8	0 40	8 1														
M.	30	8 38	6 43	8	3	7 16	8 5	4 11	6 5	4 37	6 9	1 16	8 11	1 48	9 1														
Tu.	31	9 32	7 45	8	8	8 11	8 11	5 0	7 0	5 22	7 3	2 17	9 9	2 42	10 1														
Half Mean Spring } Range.			4 ^{ft.} 9 ^{in.}				3 ^{ft.} 10 ^{in.}				5 ^{ft.} 7 ^{in.}																		
Phases of the Moon.															Moon's Declination at Noon.														
			D. H. M.				M.D. ° ' "				M.D. ° ' "				M.D. ° ' "														
Full - - - - -			4 10 31 Afternoon.				1 10 8.15 9 18 N. 31 17 18.55 25 18 11																						
Last Quarter -			11 3 22 Afternoon.				2 6 6 10 18 22 18 5 37 26 16 51																						
New - - - - -			19 4 27 Afternoon.				3 1 28 11 17 11 19 9 6 27 14 34																						
First Quarter -			27 3 50 Afternoon.				4 3 N. 21 12 15 8 20 12 13 28 11 35																						
In Perigee - -			5 6 0 Morning.				5 7 59 13 12 25 21 14 51 29 7 48																						
In Apogee - -			19 7 0 Morning.				6 12 5 14 9 11 22 16 52 30 3 25																						
							7 15 21 15 5 37 23 18 9 31 1 10																						
							8 17 31 16 1 52 24 18 37																						

The times for High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—
 BELFAST subtract 2 m. LONDONDERRY add 4 m. SLIGO BAY add 9 m.

OCTOBER, 1865.

GALWAY.				QUEENSTOWN.				WATERFORD.				C's Age AT NOON.
MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	
1 2 11 7	1 31 12 3	1 5 9 6	1 40 9 11	1 14 10 3	1 49 10 8	11°6						
1 59 12 11	2 25 13 7	2 13 10 5	2 42 10 10	2 24 11 2	2 57 11 8	12°6						
1 49 14 3	3 10 14 10	3 8 11 4	3 31 11 9	3 24 12 1	3 50 12 6	13°6						
1 32 15 5	3 55 15 10	3 55 12 2	4 18 12 6	4 16 12 11	4 41 13 2	0						
1 17 16 3	4 40 16 6	4 41 12 9	5 5 12 11	5 4 13 4	5 27 13 6	15°6						
1 3 16 8	5 25 16 7	5 29 13 0	5 52 12 11	5 50 13 8	6 12 13 7	16°6						
1 48 16 4	6 11 16 0	6 14 12 10	6 37 12 7	6 35 13 6	6 59 13 4	17°6						
1 35 15 6	7 0 15 0	7 1 12 3	7 24 11 11	7 22 13 1	7 44 12 10	18°6						
1 24 14 4	7 49 13 8	7 47 11 6	8 8 11 0	8 6 12 5	8 27 12 0	19°6						
1 16 12 11	8 44 12 2	8 30 10 7	8 55 10 2	8 48 11 7	9 10 11 2	20°6						
1 14 11 6	9 47 11 1	9 21 9 8	9 50 9 4	9 37 10 8	10 10 10 3	21°6						
1 27 10 9	11 8 10 8	10 26 9 1	11 6 9 0	10 47 9 11	11 25 9 9	22°6						
1 49 10 8	— —	11 47 8 11	— —	— —	0 2 9 8	23°6						
1 28 10 10	1 2 11 2	0 27 9 1	1 4 9 3	0 39 9 10	1 14 10 0	24°6						
1 31 11 7	1 57 12 0	1 40 9 6	2 10 9 9	1 48 10 3	2 21 10 7	25°6						
1 21 12 4	2 41 12 9	2 36 10 0	2 59 10 4	2 50 10 10	3 14 11 1	26°6						
1 13 11	3 18 13 4	3 19 10 7	3 38 10 10	3 37 11 4	3 57 11 7	27°6						
1 35 13 7	3 52 13 10	3 57 11 0	4 15 11 2	4 18 11 9	4 37 11 10	28°6						
1 7 14 0	4 22 14 2	4 31 11 3	4 47 11 4	4 54 11 11	5 10 12 0	29°6						
1 38 14 4	4 54 14 4	5 4 11 5	5 21 11 5	5 25 12 0	5 41 12 1	0°8						
1 11 14 4	5 27 14 3	5 38 11 5	5 54 11 4	5 58 12 1	6 14 12 0	1°8						
1 43 14 1	5 59 13 11	6 9 11 3	6 25 11 2	6 30 12 0	6 46 11 11	2°8						
1 15 13 8	6 33 13 5	6 41 11 0	6 58 10 10	7 2 11 10	7 19 11 9	3°8						
1 52 13 1	7 12 12 9	7 16 10 7	7 34 10 5	7 36 11 7	7 53 11 5	4°8						
1 33 12 5	7 56 12 0	7 53 10 2	8 12 9 11	8 11 11 2	8 30 10 11	5°8						
1 21 11 7	8 47 11 2	8 34 9 9	8 57 9 6	8 50 10 9	9 11 10 6	6°8						
1 17 10 11	9 53 10 9	9 22 9 4	9 53 9 2	9 39 10 3	10 16 10 1	7°8						
1 32 10 10	11 14 11 0	10 31 9 1	11 11 9 2	10 53 10 0	11 29 10 0	8°8						
1 52 11 4	— —	11 50 9 4	— —	— —	0 4 10 1	9°8						
1 28 11 9	1 0 12 4	0 27 9 8	1 4 10 0	0 39 10 5	1 13 10 9	10°8						
1 28 12 11	1 54 13 6	1 38 10 4	2 10 10 10	1 47 11 2	2 21 11 7	11°8						
Mean Spring } 7ft. 5in. Range.				5ft. 10in.				6ft. 2in.				

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
0 24		9	12 45		17	14 37		25	15 50	
0 43		10	13 1		18	14 49		26	15 56	
1 1		11	13 16		19	14 59		27	16 2	
1 20		12	13 31		20	15 9		28	16 6	
1 37		13	13 46		21	15 19		29	16 10	
1 55		14	13 59		22	15 28		30	16 13	
2 12		15	14 13		23	15 36		31	16 16	
2 29		16	14 25		24	15 43				

f High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.

NOVEMBER, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
		H. M.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
			H. M. P. I.		H. M. P. I.		H. M. P. I.		H. M. P. I.		H. M. P. I.		H. M. P. I.	
W.	1	10 28	1 29 18	2	1 53 19	0	3 16 14	8	3 44 15	5	9 23 12	4	9 48	
Th.	2	11 26	2 16 19	9	2 40 20	5	4 11 15	7	4 37 16	1	10 12 13	1	10 36	
F.	3	MOON	3 4 20	9	3 28 21	0	5 2 16	2	5 26 16	6	11 0 13	6	11 24	
S.	4	0 25	3 53 21	0	4 16 20	11	5 50 16	6	6 14 16	6	11 49 13	7	—	
♄	5	1 26	4 39 20	9	5 2 20	4	6 38 16	6	6 59 16	2	0 13 13	6	0 38	
M.	6	2 25	5 23 19	9	5 47 19	2	7 21 16	1	7 42 15	7	1 2 13	3	1 25	
Tu.	7	3 23	6 10 18	6	6 33 17	8	8 4 15	6	8 24 14	9	1 48 12	9	2 11	
W.	8	4 18	6 58 16	10	7 24 16	0	8 46 14	8	9 9 13	8	2 34 12	0	2 58	
Th.	9	5 10	7 49 15	3	8 18 14	6	9 33 13	9	9 57 12	8	3 22 11	4	3 47	
F.	10	5 58	8 50 14	0	9 24 13	9	10 25 12	11	10 55 12	0	4 15 10	7	4 45	
S.	11	6 44	10 1 13	7	10 40 13	8	11 29 12	5	—	—	5 17 10	1	5 53	
♄	12	7 28	11 18 13	9	11 53 14	1	0 6 11	10	0 43 12	6	6 29 9	11	7 6	
M.	13	8 10	—	—	0 23 14	6	1 20 12	3	1 54 12	0	7 40 10	3	8 13	
Tu.	14	8 53	0 50 14	11	1 15 15	5	2 24 12	11	2 50 13	7	8 41 10	9	9 6	
W.	15	9 35	1 36 15	11	1 56 16	4	3 16 13	8	3 40 14	0	9 30 11	3	9 51	
Th.	16	10 19	2 14 16	9	2 31 17	2	4 2 14	1	4 23 14	4	10 9 11	7	10 27	
F.	17	11 8	2 49 17	6	3 6 17	9	4 41 14	5	5 0 14	7	10 45 11	11	11 2	
S.	18	11 50	3 23 17	11	3 40 18	0	5 17 14	9	5 34 14	9	11 19 12	0	11 35	
♄	19	0 38	3 57 18	0	4 14 18	0	5 50 14	11	6 7 14	9	11 53 12	1	—	
M.	20	1 27	4 31 18	0	4 47 17	11	6 25 15	0	6 41 14	7	0 11 12	1	0 29	
Tu.	21	2 17	5 4 17	9	5 20 17	6	6 55 14	10	7 12 14	4	0 47 12	0	1 4	
W.	22	3 8	5 39 17	4	5 59 17	1	7 29 14	7	7 47 13	11	1 22 11	11	1 40	
Th.	23	3 58	6 20 16	8	6 42 16	4	8 5 14	3	8 25 13	5	2 0 11	8	2 22	
F.	24	4 49	7 6 15	11	7 31 15	6	8 46 13	9	9 8 12	11	2 44 11	5	3 6	
S.	25	5 39	7 58 15	1	8 27 14	9	9 34 13	4	10 1 12	6	3 29 11	1	3 55	
♄	26	6 29	8 58 14	8	9 34 14	9	10 31 13	0	11 4 12	4	4 23	9	4 53	
M.	27	7 20	10 12 14	10	10 49 15	1	11 43 13	0	—	—	5 27 10	6	6 3	
Tu.	28	8 13	11 26 15	6	—	—	0 23 12	9	1 2 13	6	6 38 10	8	7 13	
W.	29	9 8	0 2 16	1	0 33 16	8	1 40 13	6	2 17 14	3	7 49 11	3	8 23	
Th.	30	10 5	1 2 17	4	1 30 18	0	2 47 14	5	3 17 14	11	8 54 12	0	9 24	

Half Mean Spring } 9^{ft} 6ⁱⁿ.
Range.7^{ft} 9ⁱⁿ.6^{ft} 4ⁱⁿ.

Phases of the Moon.

Moon's Declination at Noon.

	D.	H.		M.D.	°	'	M.D.	°	'	M.D.	°	'	M.D.	°	'
Full - - - - -	3	8	3 Morning.	1	5	N. 51	9	13	N. 19	17	14	S. 14	25		
Last Quarter -	10	5	45 Morning.	2	10	14	10	10	10	18	16	27	26		
New - - - - -	18	11	0 Morning.	3	13	58	11	6	38	19	17	58	27		
First Quarter	26	2	59 Morning.	4	16	43	12	2	54	20	18	39	28		
				5	18	17	13	0	S. 54	21	18	28	29		
In Perigee - -	2	6	0 Afternoon.	6	18	36	14	4	39	22	17	22	30		
In Apogee - -	15	0	0 Noon.	7	17	45	15	8	12	23	15	22			
				8	15	56	16	11	27	24	12	34			

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
Brest add 18 m. Devonport add 17 m. Portsmouth add 6 m.

NOVEMBER, 1865.

WEEK DAY.	MONTH DAY.	DOVER.				SHEERNESS.				LONDON.				C's AGE AT NOON.																														
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.																																
		Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.																															
W.	1	8 46	18 1	9 11	18 8	10 39	15 5	11 3	15 10	—	—	0 7	17 11	12·8																														
Th.	2	9 37	19 2	10 3	19 8	11 26	16 3	11 49	16 7	0 33	18 5	0 57	18 11	13·8																														
F.	3	10 28	20 0	10 55	20 2	—	—	0 13	16 11	1 20	19 4	1 44	19 9	○																														
S.	4	11 21	20 3	11 47	20 2	0 37	17 1	1 1	17 3	2 7	20 1	2 30	20 3	15·8																														
S.	5	—	—	0 12	20 0	1 25	17 3	1 48	17 2	2 54	20 4	3 16	20 4	16·8																														
M.	6	0 37	19 9	1 3	19 5	2 10	17 0	2 32	16 9	3 38	20 3	4 1	20 0	17·8																														
Tu.	7	1 28	18 11	1 51	18 6	2 53	16 5	3 16	16 1	4 25	19 8	4 48	19 4	18·8																														
W.	8	2 14	17 10	2 38	17 3	3 40	15 8	4 3	15 2	5 13	18 11	5 36	18 5	19·8																														
Th.	9	3 3	16 7	3 28	16 0	4 28	14 8	4 54	14 3	6 0	17 11	6 26	17 5	20·8																														
F.	10	3 55	15 5	4 23	14 10	5 22	13 10	5 53	13 6	6 53	17 0	7 24	16 7	☾																														
S.	11	4 52	14 6	5 24	14 4	6 28	13 2	7 4	13 0	7 58	16 2	8 35	16 0	22·8																														
S.	12	5 57	14 3	6 32	14 5	7 43	13 0	8 21	13 2	9 10	15 10	9 46	15 9	23·8																														
M.	13	7 6	14 10	7 38	15 2	8 57	13 4	9 30	13 7	10 21	15 10	10 56	16 0	24·8																														
Tu.	14	8 6	15 6	8 30	15 11	10 0	13 10	10 25	14 11	11 25	16 3	11 53	16 6	25·8																														
W.	15	8 53	16 3	9 14	16 7	10 49	14 4	11 10	14 7	—	—	0 18	16 9	26·8																														
Th.	16	9 33	16 10	9 52	17 1	11 29	14 9	11 47	15 0	0 39	17 0	0 59	17 3	27·8																														
F.	17	10 12	17 4	10 30	17 6	—	—	0 4	15 2	1 20	17 6	1 37	17 9	28·8																														
S.	18	10 48	17 8	11 8	17 9	0 22	15 4	0 39	15 5	1 54	18 0	2 9	18 2	●																														
S.	19	11 26	17 9	11 45	17 10	0 56	15 6	1 12	15 7	2 26	18 3	2 42	18 5	1·0																														
M.	20	—	—	0 3	17 10	1 29	15 7	1 46	15 6	2 58	18 6	3 14	18 6	2·0																														
Tu.	21	0 22	17 9	0 40	17 8	2 2	15 5	2 18	15 5	3 30	18 6	3 48	18 6	3·0																														
W.	22	0 59	17 7	1 19	17 5	2 34	15 4	2 50	15 2	4 5	18 5	4 21	18 3	4·0																														
Th.	23	1 40	17 3	2 2	17 0	3 8	15 0	3 29	14 10	4 40	18 2	4 59	18 0	5·0																														
F.	24	2 24	16 9	2 47	16 6	3 51	14 8	4 13	14 5	5 21	17 9	5 42	17 7	6·0																														
S.	25	3 10	16 2	3 36	15 11	4 36	14 2	5 1	14 0	6 6	17 4	6 31	17 1	7·0																														
S.	26	4 3	15 7	4 31	15 4	5 30	13 9	6 2	13 7	6 59	16 10	7 29	16 8	8·0																														
M.	27	5 2	15 3	5 33	15 3	6 37	13 5	7 14	13 7	8 3	16 7	8 40	16 7	9·0																														
Tu.	28	6 5	15 6	6 39	15 11	7 54	13 9	8 30	14 0	9 18	16 7	9 55	16 8	10·0																														
W.	29	7 16	16 5	7 48	16 11	9 5	14 4	9 39	14 8	10 32	16 11	11 5	17 3	11·0																														
Th.	30	8 18	17 6	8 47	17 11	10 9	15 0	10 37	15 5	11 37	17 7	—	—	12·0																														
Half Mean Spring } 9ft. 4in. Range.															8ft. 0in.															9ft. 7in.														

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	16	17		9	16	1		17	14	49		25	12	45	
2	16	18		10	15	55		18	14	36		26	12	26	
3	16	18		11	15	48		19	14	23		27	12	6	
4	16	17		12	15	40		20	14	8		28	11	45	
5	16	16		13	15	32		21	13	53		29	11	24	
6	16	13		14	15	22		22	13	37		30	11	3	
7	16	10		15	15	12		23	13	20					
8	16	6		16	15	1		24	13	3					

*** times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for**

Dover subtract 5 m.		BREMEN subtract 3 m.		LONDON 0 m.
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TIDE TABLES FOR THE

NOVEMBER, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	HARWICH.				HULL.				SUNDERLAND.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTER.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	10 28	9 48	11 3	10 14	11 6	4 8	19 10	4 32	20 7	0 58	13 5	1 24	
Th.	2	11 26	10 37	11 9	11 1	12 0	4 54	21 2	5 16	21 8	1 49	14 4	2 14	
F.	3	morn.	11 26	12 3	11 50	12 4	5 42	22 1	6 7	22 4	2 38	15 1	3 0	
S.	4	0 25	—	—	0 13	12 4	6 31	22 6	6 56	22 7	3 23	15 6	3 47	
♄.	5	1 26	0 37	12 4	1 1	12 3	7 20	22 6	7 43	22 3	4 10	15 7	4 33	
M.	6	2 25	1 24	12 1	1 47	11 11	8 5	22 0	8 28	21 6	4 55	15 1	5 19	
Tu.	7	3 23	2 11	11 8	2 35	11 5	8 52	20 10	9 16	20 3	5 43	14 3	6 7	
W.	8	4 18	2 58	11 2	3 21	10 11	9 39	19 6	10 4	18 10	6 32	13 3	6 59	
Th.	9	5 10	3 44	10 7	4 8	10 4	10 31	18 2	11 2	17 7	7 26	12 3	7 54	
F.	10	5 58	4 35	10 1	5 4	9 11	11 37	17 0	—	—	8 25	11 6	8 59	
S.	11	6 44	5 36	9 9	6 10	9 8	0 13	16 6	0 47	16 3	9 35	11 0	10 12	
♄.	12	7 28	6 51	9 8	7 29	9 9	1 21	16 2	1 55	16 3	10 47	10 11	11 21	
M.	13	8 10	8 5	9 10	8 37	10 0	2 27	16 6	2 59	17 0	11 51	11 4	—	
Tu.	14	8 53	9 7	10 2	9 33	10 4	3 28	17 5	3 54	17 10	0 19	11 8	0 44	
W.	15	9 35	9 58	10 6	10 21	10 8	4 18	18 3	4 39	18 7	1 8	12 3	1 31	
Th.	16	10 19	10 40	10 10	10 58	10 11	4 57	18 11	5 15	19 2	1 52	12 9	2 11	
F.	17	11 3	11 17	11 1	11 35	11 2	5 33	19 4	5 51	19 7	2 29	13 1	2 47	
S.	18	11 50	11 52	11 3	—	—	6 9	19 8	6 27	19 10	3 3	13 5	3 19	
♄.	19	0 38	0 9	11 1	0 25	11 3	6 43	19 11	7 0	19 11	3 35	13 8	3 52	
M.	20	1 27	0 41	11 1	0 59	11 2	7 18	19 11	7 35	19 11	4 8	13 9	4 25	
Tu.	21	2 17	1 17	11 1	1 33	11 0	7 51	19 10	8 8	19 9	4 41	13 8	4 58	
W.	22	3 8	1 50	10 11	2 7	10 10	8 25	19 6	8 44	19 3	5 15	13 3	5 35	
Th.	23	3 58	2 26	10 9	2 47	10 7	9 5	18 11	9 27	18 8	5 56	12 10	6 19	
F.	24	4 49	3 9	10 6	3 30	10 5	9 49	18 4	10 12	18 1	6 43	12 5	7 8	
S.	25	5 39	3 52	10 3	4 15	10 2	10 38	17 9	11 11	17 5	7 33	12 0	8 3	
♄.	26	6 29	4 43	10 1	5 12	10 0	11 46	17 3	—	—	8 34	11 8	9 8	
M.	27	7 20	5 44	10 0	6 20	10 1	0 22	17 1	0 57	17 2	9 45	11 7	10 22	
Tu.	28	8 13	7 2	10 2	7 38	10 3	1 31	17 3	2 3	17 7	10 56	11 10	11 27	
W.	29	9 8	8 12	10 6	8 46	10 9	2 34	18 1	3 6	18 9	11 58	12 7	—	
Th.	30	10 5	9 16	11 0	9 45	11 3	3 38	19 4	4 5	19 11	0 28	13 0	0 56	
Half Mean Spring Range			5 ft. 9 in.				10 ft. 5 in.				7 ft. 2 in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°
Full - - - -	3	8	3	Morning.			1	5	N. 51	9	13	N. 19	17	14 8. 14
Last Quarter -	10	5	45	Morning.			2	10	14	10	10	10	18	16 27
New - - - -	18	11	0	Morning.			3	13	58	11	6	38	19	17 58
First Quarter	26	2	59	Morning.			4	16	43	12	2	54	20	18 39
							5	18	17	13	0	54	21	18 28
In Perigee - -	2	6	0	Afternoon.			6	18	36	14	4	39	22	17 22
In Apogee - -	15	0	0	Noon.			7	17	45	15	8	12	23	15 22
							8	15	56	16	11	27	24	12 34

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 HARWICH subtract 5 m. | HULL add 1 m. | SUNDERLAND add 5 m.

NOVEMBER, 1865.

WEEK DAY.	MONTH DAY.	NORTH SHIELDS.								LEITH.								THURSO.								C's AGE AT NOON.	
		MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.					
		Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	Time. H. M. F. I.	Height. H. M. F. I.	D.									
W.	1	1	7	12	2	1	3	1	12	8	0	2	15	0	0	25	15	8	6	24	12	6	6	45	13	1	12.8
Th.	2	1	53	13	2	2	15	13	7	0	48	16	3	1	11	16	9	7	4	13	8	7	25	14	2	13.8	
F.	3	2	38	14	0	3	1	14	3	1	35	17	2	1	59	17	6	7	47	14	6	8	10	14	8	○	
S.	4	3	24	14	5	3	48	14	5	2	22	17	8	2	44	17	8	8	32	14	7	8	55	14	6	15.8	
D.	5	4	11	14	4	4	35	14	2	3	7	17	6	3	30	17	3	9	19	14	3	9	43	13	11	16.8	
M.	6	4	59	13	10	5	23	13	5	3	53	16	11	4	17	16	6	10	8	13	6	10	33	13	0	17.8	
Tu.	7	5	47	13	1	6	11	12	8	4	42	16	1	5	6	15	8	10	57	12	6	11	22	11	11	18.8	
W.	8	6	34	12	2	7	0	11	9	5	30	15	2	5	57	14	7	11	49	11	5	—	—	—	—	19.8	
Th.	9	7	30	11	2	8	0	10	8	6	25	14	0	6	54	13	6	0	17	10	10	0	46	10	5	20.8	
F.	10	8	33	10	3	9	10	10	0	7	28	13	1	8	3	12	9	1	18	10	0	1	54	9	8	○	
S.	11	9	48	9	11	10	24	9	10	8	40	12	6	9	18	12	6	2	32	9	6	3	14	9	5	22.8	
D.	12	10	59	9	11	11	33	10	1	9	54	12	6	10	27	12	8	3	52	9	4	4	28	9	5	23.8	
M.	13	—	—	—	—	0	5	10	4	10	58	12	11	11	26	13	2	5	0	9	7	5	28	9	10	24.8	
Tu.	14	0	32	10	7	0	56	10	10	11	51	13	5	—	—	—	5	52	10	2	6	13	10	6	25.8		
W.	15	1	18	11	0	1	38	11	3	0	12	13	9	0	32	14	1	6	33	10	11	6	49	11	3	26.8	
Th.	16	1	57	11	6	2	14	11	9	0	51	14	5	1	9	14	8	7	4	11	7	7	19	11	11	27.8	
F.	17	2	31	12	0	2	47	12	2	1	27	15	0	1	44	15	3	7	34	12	2	7	50	12	5	28.8	
S.	18	3	3	12	4	3	19	12	6	2	1	15	5	2	18	15	6	8	6	12	6	8	22	12	7	●	
D.	19	3	36	12	7	3	52	12	7	2	34	15	7	2	49	15	7	8	38	12	7	8	54	12	6	1.0	
M.	20	4	9	12	7	4	27	12	6	3	5	15	6	3	22	15	5	9	11	12	5	9	29	12	4	2.0	
Tu.	21	4	44	12	4	5	1	12	3	3	39	15	4	3	56	15	2	9	46	12	2	10	4	12	0	3.0	
W.	22	5	18	12	1	5	39	11	11	4	14	15	0	4	33	14	10	10	24	11	9	10	46	11	6	4.0	
Th.	23	6	0	11	9	6	22	11	7	4	54	14	8	5	17	14	6	11	9	11	3	11	33	11	0	5.0	
F.	24	6	45	11	5	7	10	11	2	5	41	14	3	6	6	13	11	11	58	10	9	—	—	—	—	6.0	
S.	25	7	37	10	11	8	8	10	7	6	32	13	8	7	3	13	5	0	24	10	6	0	54	10	4	7.0	
D.	26	8	42	10	5	9	18	10	4	7	37	13	3	8	12	13	2	1	27	10	2	2	3	10	1	8	8.0
M.	27	9	58	10	6	10	34	10	8	8	50	13	2	9	29	13	4	2	42	10	2	3	25	10	3	9.0	
Tu.	28	11	8	10	11	11	40	11	2	10	2	13	7	10	34	13	10	4	1	10	4	4	34	10	7	10.0	
W.	29	—	—	—	—	0	12	11	6	11	5	14	3	11	35	14	8	5	7	10	10	5	36	11	4	11.0	
Th.	30	0	40	11	11	1	6	12	3	—	—	—	—	0	1	15	1	6	2	11	10	6	26	12	4	12.0	
Half Mean Spring Range.		6ft. 8in.								8ft. 2in.								6ft. 7in.									

Equation of Time at Noon.

M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.	M.D.	M.	S.	Add.
1	16	17	Add.	9	16	1	Add.	17	14	49	Add.	25	12	45	Add.
2	16	18		10	15	55		18	14	36		26	12	26	
3	16	18		11	15	48		19	14	23		27	12	6	
4	16	17		12	15	40		20	14	8		28	11	45	
5	16	16		13	15	32		21	13	53		29	11	24	
6	16	13		14	15	22		22	13	37		30	11	3	
7	16	10		15	15	12		23	13	20					
8	16	6		16	15	1		24	13	3					

the times of High Water are given for Mean Time at Place ; if Greenwich or Railway Time be required—for
NORTH SHIELDS add 6 m. | LEITH add 13 m. | THURSO add 14 m.

NOVEMBER, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
W.	1	10 28	9 44	9 6	10 9	9 8	9 5	25 3	9 28	26 1	3 42	20 1	4 9	
Th.	2	11 26	10 34	9 10	11 0	10 0	9 50	26 9	10 13	27 4	4 36	21 6	5 3	
F.	3	morn.	11 26	10 2	11 51	10 3	10 38	27 9	11 9	28 0	5 30	22 6	5 55	
S.	4	0 25	—	—	0 16	10 4	11 27	28 2	11 51	28 1	6 19	22 11	6 42	
S.	5	1 26	0 40	10 3	1 5	10 3	—	—	0 15	27 10	7 5	22 8	7 28	
M.	6	2 25	1 28	10 2	1 51	10 1	0 38	27 5	1 1	26 9	7 51	21 8	8 15	
Tu.	7	3 23	2 14	9 10	2 36	9 8	1 23	26 0	1 46	25 2	8 38	20 5	9 0	
W.	8	4 18	2 58	9 5	3 21	9 3	2 8	24 3	2 31	23 5	9 22	18 10	9 45	
Th.	9	5 10	3 46	9 1	4 11	8 10	2 56	22 7	3 22	21 9	10 8	17 5	10 33	
F.	10	5 58	4 39	8 8	5 10	8 5	3 53	21 0	4 27	20 4	10 59	15 11	11 28	
S.	11	6 44	5 43	8 4	6 19	8 2	5 4	20 1	5 44	19 11	—	—	0 1	
S.	12	7 28	6 55	8 2	7 31	8 2	6 24	20 0	7 1	20 4	0 37	15 4	1 17	
M.	13	8 10	8 5	8 4	8 35	8 6	7 33	20 9	8 4	21 3	1 54	15 10	2 28	
Tu.	14	8 53	9 3	8 7	9 28	8 9	8 28	21 9	8 51	22 3	2 57	16 9	3 23	
W.	15	9 35	9 51	8 10	10 11	8 11	9 12	22 9	9 31	23 2	3 49	17 10	4 11	
Th.	16	10 19	10 30	9 0	10 49	9 1	9 48	23 6	10 5	23 10	4 32	18 7	4 52	
F.	17	11 3	11 8	9 2	11 27	9 2	10 23	24 2	10 41	24 4	5 13	19 3	5 32	
S.	18	11 50	11 46	9 3	—	—	10 58	24 6	11 15	24 9	5 50	19 8	6 7	
S.	19	0 38	0 3	9 4	0 20	9 4	11 32	24 9	11 50	24 9	6 23	19 11	6 40	
M.	20	1 27	0 38	9 5	0 56	9 5	—	—	0 7	24 9	6 57	19 11	7 14	
Tu.	21	2 17	1 13	9 5	1 30	9 4	0 24	24 8	0 40	24 7	7 30	19 8	7 47	
W.	22	3 8	1 47	9 4	2 5	9 4	0 57	24 3	1 15	23 11	8 6	19 3	8 27	
Th.	23	3 58	2 25	9 3	2 46	9 2	1 35	23 7	1 56	23 2	8 48	18 8	9 9	
F.	24	4 49	3 7	9 1	3 29	9 0	2 18	22 10	2 40	22 6	9 30	18 0	9 52	
S.	25	5 39	3 53	8 11	4 20	8 10	3 4	22 0	3 31	21 7	10 16	17 3	10 41	
S.	26	6 29	4 47	8 9	5 18	8 8	4 22	21 3	4 36	21 0	11 7	16 7	11 38	
M.	27	7 20	5 53	8 7	6 29	8 6	5 14	21 1	5 55	21 3	—	—	0 11	
Tu.	28	8 13	7 4	8 7	7 39	8 9	6 33	21 9	7 8	22 3	0 46	16 10	1 25	
W.	29	9 8	8 14	8 11	8 45	9 2	7 42	23 0	8 12	23 8	2 5	17 10	2 39	
Th.	30	10 5	9 15	9 4	9 45	9 6	8 40	24 5	9 5	25 1	3 11	19 3	3 43	
Half Mean Spring Range.			4 ^{ft.} 10 ^{in.}				13 ^{ft.} 0 ^{in.}				10 ^{ft.} 6 ^{in.}			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°
Full - - - - -	3	8	3	Morning.			1	5	N. 51	9	13	N. 19	17	14 5. 14
Last Quarter -	10	5	45	Morning.			2	10	14	10	10	10	18	16 27
New - - - - -	18	11	0	Morning.			3	13	58	11	6	38	19	17 58
First Quarter	26	2	59	Morning.			4	16	43	12	2	54	20	18 39
							5	18	17	13	0	54	21	18 28
In Perigee - -	2	6	0	Afternoon.			6	18	36	14	4	39	22	17 22
In Apogee - -	15	0	0	Noon.			7	17	45	15	8	12	23	15 22
							8	15	56	16	11	27	24	12 34

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required
 GREENOCK add 18 m. LIVERPOOL add 12 m. PEMBROKE add 20 m.

NOVEMBER, 1865.

WEEK DAY.	MONTH DAY.	WESTON-SUPER-MARE.				HOLYHEAD.				KINGSTOWN.				C's Age at Noon.
		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
		Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	Time. H. M. P. I.	Height.	
F.	1	4 22 35 7	4 51 36 11	8 1 15 7	8 23 16 1	8 57 10 7	9 22 10 11	12 8						
F.	2	5 18 38 0	5 45 39 0	8 45 16 6	9 9 16 11	9 44 11 2	10 6 11 5	13 8						
.	3	6 12 39 7	6 38 40 0	9 32 17 1	9 55 17 3	10 29 11 7	10 52 11 8	0						
.	4	7 3 40 4	7 26 40 3	10 17 17 4	10 38 17 3	11 15 11 8	11 39 11 7	15 8						
.	5	7 49 40 0	8 11 39 5	11 0 17 1	11 24 16 9	—	0 3 11 6	16 8						
L.	6	8 33 38 8	8 54 37 9	11 49 16 5	—	0 27 11 4	0 52 11 1	17 8						
F.	7	9 15 36 9	9 34 35 5	0 14 16 0	0 39 15 6	1 16 10 9	1 40 10 6	18 8						
F.	8	9 54 34 2	10 14 32 10	1 5 14 11	1 31 14 5	2 4 10 2	2 30 9 11	19 8						
F.	9	10 35 31 8	11 0 30 5	1 58 13 11	2 27 13 6	2 57 9 8	3 25 9 5	20 8						
.	10	11 30 29 5	—	2 59 13 1	3 35 12 9	3 58 9 2	4 32 8 11	21 8						
.	11	0 3 28 9	0 38 28 5	4 13 12 7	4 51 12 6	5 7 8 10	5 42 8 9	22 8						
.	12	1 15 28 5	1 52 28 7	5 27 12 7	6 1 12 9	6 15 8 10	6 48 9 0	23 8						
L.	13	2 27 29 1	3 1 29 9	6 32 13 0	7 0 13 3	7 19 9 2	7 48 9 4	24 8						
.	14	3 32 30 4	4 1 31 1	7 24 13 6	7 47 13 9	8 15 9 5	8 40 9 7	25 8						
F.	15	4 27 31 11	4 52 32 8	8 8 14 1	8 27 14 4	9 4 9 9	9 25 9 11	26 8						
.	16	5 13 33 3	5 33 33 10	8 43 14 6	9 0 14 9	9 43 10 0	10 0 10 2	27 8						
.	17	5 54 34 4	6 14 34 9	9 17 14 11	9 34 15 1	10 15 10 4	10 32 10 5	28 8						
.	18	6 32 35 0	6 49 35 3	9 51 15 2	10 7 15 3	10 48 10 6	11 4 10 7	29 8						
.	19	7 7 35 5	7 24 35 6	10 22 15 3	10 37 15 3	11 20 10 7	11 37 10 7	30 8						
L.	20	7 41 35 6	7 57 35 5	10 53 15 2	11 10 15 1	11 55 10 6	—	31 8						
.	21	8 13 35 3	8 29 35 0	11 27 15 0	11 45 14 11	0 13 10 5	0 30 10 4	32 8						
F.	22	8 46 34 9	9 5 34 4	—	0 5 14 8	0 48 10 3	1 8 10 1	33 8						
F.	23	9 24 33 10	9 42 33 4	0 28 14 6	0 51 14 3	1 29 9 11	1 51 9 10	34 8						
.	24	10 1 32 9	10 21 32 0	1 15 14 1	1 40 13 10	2 15 9 9	2 39 9 7	35 8						
.	25	10 43 31 5	11 8 30 10	2 6 13 7	2 35 13 5	3 4 9 6	3 33 9 4	36 8						
.	26	11 38 30 5	—	3 8 13 3	3 44 13 2	4 7 9 3	4 42 9 2	37 8						
L.	27	0 13 30 4	0 48 30 5	4 23 13 3	5 1 13 4	5 17 9 2	5 51 9 3	38 8						
.	28	1 24 30 10	2 0 31 5	5 36 13 8	6 8 13 11	6 23 9 5	6 55 9 8	39 8						
F.	29	2 37 32 3	3 13 33 2	6 38 14 4	7 8 14 8	7 27 9 11	7 58 10 1	40 8						
F.	30	3 48 34 3	4 22 35 4	7 35 15 1	8 1 15 6	8 28 10 4	8 58 10 7	41 8						
Half Mean Spring Range.		18 ^{ft.} 7 ^{in.}				8 ^{ft.} 0 ^{in.}				5 ^{ft.} 6 ^{in.}				

Equation of Time at Noon.

M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.
1	16 17	Add.	9	16 1	Add.	17	14 49	Add.	25	12 45	Add.
2	16 18		10	15 55		18	14 36		26	12 26	
3	16 18		11	15 48		19	14 23		27	12 6	
4	16 17		12	15 40		20	14 8		28	11 45	
5	16 16		13	15 32		21	13 53		29	11 24	
6	16 13		14	15 22		22	13 37		30	11 3	
7	16 10		15	15 12		23	13 20				
8	16 6		16	15 1		24	13 3				

Times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 WESTON-SUPER-MARE add 13 m. | HOLYHEAD add 18 m. | KINGSTOWN subtract 1 m. for Dublin Time.

NOVEMBER, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
W.	1	10 28	8 35	9 3	8 58	9 6	5 45	7 6	6 8	7 9	3 4	10 8	3 25	1	
Th.	2	11 26	9 21	9 8	9 45	9 10	6 32	8 0	6 57	8 2	3 47	11 6	4 11	2	
F.	3	morn.	10 8	9 11	10 31	9 11	7 22	8 4	7 45	8 5	4 35	12 0	5 0	3	
S.	4	0 25	10 54	9 11	11 16	9 11	8 7	8 6	8 28	8 5	5 24	12 3	5 46	4	
S.	5	1 26	11 39	9 10	—	—	8 50	8 3	9 12	8 0	6 9	12 0	6 33	5	
M.	6	2 25	0 3	9 9	0 28	9 7	9 34	7 9	9 56	7 6	6 56	11 4	7 19	6	
Tu.	7	3 23	0 53	9 5	1 18	9 4	10 19	7 3	10 43	6 11	7 42	10 5	8 51	7	
W.	8	4 18	1 44	9 1	2 12	8 11	11 14	6 7	11 47	6 2	8 32	9 7	9 1	8	
Th.	9	5 10	2 40	8 8	3 9	8 6	—	—	0 24	5 11	9 33	8 10	10 8	9	
F.	10	5 58	3 40	8 4	4 14	8 2	1 3	5 9	1 46	5 7	10 45	8 5	11 21	10	
S.	11	6 44	4 48	8 1	5 22	8 0	2 25	5 7	3 1	5 9	11 56	8 3	—	11	
S.	12	7 28	5 57	8 0	6 33	8 0	3 33	5 11	4 4	6 0	0 31	8 4	1 6	12	
M.	13	8 10	7 5	8 1	7 34	8 2	4 29	6 2	4 53	6 4	1 38	8 7	2 7	1	
Tu.	14	8 53	7 59	8 4	8 21	8 6	5 14	6 5	5 33	6 7	2 31	9 0	2 52	2	
W.	15	9 35	8 42	8 8	9 1	8 10	5 52	6 9	6 11	6 10	3 12	9 6	3 29	3	
Th.	16	10 19	9 18	8 11	9 36	9 0	6 29	6 11	6 48	7 0	3 45	10 0	4 21	4	
F.	17	11 3	9 53	9 1	10 10	9 2	7 6	7 1	7 24	7 2	4 20	10 4	4 37	5	
S.	18	11 50	10 27	9 2	10 43	9 2	7 41	7 3	7 57	7 3	4 55	10 7	5 12	6	
S.	19	0 28	10 59	9 2	11 15	9 2	8 12	7 4	8 27	7 4	5 29	10 9	5 45	7	
M.	20	1 27	11 31	9 2	11 48	9 1	8 43	7 3	8 58	7 2	6 1	10 8	6 18	8	
Tu.	21	2 17	—	—	0 6	9 1	9 14	7 1	9 30	6 11	6 35	10 5	6 53	9	
W.	22	3 8	0 24	9 1	0 44	9 0	9 47	6 9	10 8	6 8	7 11	9 11	7 32	10	
Th.	23	3 58	1 6	8 11	1 30	8 10	10 30	6 6	10 54	6 5	7 53	9 6	8 16	11	
F.	24	4 49	1 56	8 9	2 22	8 8	11 24	6 3	11 55	6 0	8 41	9 2	9 9	12	
S.	25	5 39	2 48	8 6	3 17	8 5	—	—	0 33	5 10	9 42	8 10	10 17	1	
S.	26	6 29	3 49	8 4	4 23	8 4	1 12	5 10	1 55	5 10	10 53	8 9	11 31	2	
M.	27	7 20	4 58	8 4	5 33	8 4	2 35	6 0	3 11	6 2	—	—	0 6	3	
Tu.	28	8 13	6 6	8 4	6 39	8 5	3 41	6 5	4 9	6 8	0 40	9 1	1 13	4	
W.	29	9 8	7 12	8 7	7 43	8 9	4 35	6 11	4 58	7 1	1 46	9 7	2 15	5	
Th.	30	10 5	8 10	8 11	8 36	9 2	5 21	7 3	5 46	7 6	2 41	10 3	3 6	6	
Half Mean Spring Range.			4 ft. 9 in.				3 ft. 10 in.				5 ft. 7 in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	0	1	M.D.	0	1	M.D.	0	1
Full - - - - -	3	8	3	Morning.	1	15	N. 51	9	13	N. 19	17	14	S. 14	25	
Last Quarter -	10	5	45	Morning.	2	10	14	10	10	10	18	16	27	26	
New - - - - -	18	11	0	Morning.	3	13	58	11	6	38	19	17	58	27	
First Quarter	26	2	59	Morning.	4	16	43	12	2	54	20	18	39	28	
In Perigee - -	2	6	0	Afternoon.	5	18	17	13	0	54	21	18	28	29	
In Apogee - -	15	0	0	Noon.	6	18	36	14	4	39	22	17	22	30	
					7	17	45	15	8	12	23	15	22		
					8	15	56	16	11	27	24	12	34		

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required
 BELFAST subtract 3 m. LONDONDERRY add 6 m. SLIGO BAY add 9 m.

NOVEMBER, 1865.

GALWAY.								QUEENSTOWN.								WATERFORD.								C's Age at Noon.
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
mc.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	
19	14	1	2	43	14	8	2	36	11	3	3	2	11	7	2	51	12	0	3	20	12	5	12.8	
6	15	2	3	30	15	7	3	28	12	0	3	54	12	3	3	47	12	9	4	15	13	0	13.8	
55	15	11	4	18	16	2	4	18	12	6	4	43	12	8	4	41	13	2	5	6	13	3	0	
42	16	3	5	6	16	2	5	9	12	9	5	33	12	8	5	30	13	4	5	53	13	4	15.8	
30	16	0	5	54	15	9	5	57	12	7	6	20	12	5	6	17	13	3	6	41	13	1	16.8	
18	15	4	6	42	14	10	6	43	12	1	7	6	11	9	7	4	12	11	7	27	12	8	17.8	
5	14	3	7	29	13	8	7	28	11	5	7	50	11	0	7	48	12	4	8	9	12	0	18.8	
55	13	1	8	22	12	5	8	12	10	8	8	35	10	3	8	30	11	8	8	52	11	3	19.8	
49	11	10	9	19	11	4	9	0	9	11	9	25	9	7	9	15	10	11	9	42	10	7	20.8	
53	10	11	10	29	10	10	9	54	9	3	10	28	9	2	10	15	10	2	10	49	10	0	0	
6	10	9	11	43	10	10	11	4	9	0	11	41	9	0	11	23	9	10	11	56	9	9	22.8	
—	—	—	0	18	11	0	—	—	—	—	0	17	9	1	—	—	—	—	0	29	9	10	23.8	
50	11	3	1	18	11	6	0	51	9	3	1	25	9	6	1	1	10	0	1	33	10	2	24.8	
42	11	10	2	4	12	2	1	53	9	8	2	19	9	10	2	3	10	5	2	31	10	8	25.8	
26	12	5	2	47	12	9	2	43	10	1	3	5	10	4	2	57	10	11	3	21	11	1	26.8	
5	12	11	3	22	13	2	3	24	10	6	3	43	10	8	3	42	11	3	4	2	11	5	27.8	
40	13	5	3	57	13	7	4	2	10	10	4	20	11	0	4	23	11	7	4	43	11	8	28.8	
14	13	9	4	30	13	11	4	38	11	1	4	55	11	2	5	1	11	9	5	18	11	9	0	
47	14	0	5	4	14	0	5	13	11	3	5	31	11	3	5	33	11	10	5	51	11	11	1.0	
21	14	0	5	39	13	11	5	48	11	3	6	5	11	2	6	9	11	11	6	26	11	10	2.0	
56	13	10	6	13	13	7	6	22	11	1	6	39	11	0	6	43	11	10	7	0	11	9	3.0	
33	13	5	6	54	13	3	6	58	10	10	7	18	10	8	7	18	11	9	7	38	11	7	4.0	
16	12	11	7	40	12	9	7	39	10	6	7	59	10	5	7	58	11	6	8	18	11	5	5.0	
4	12	5	8	29	12	0	8	20	10	3	8	42	10	0	8	38	11	3	8	58	11	0	6.0	
58	11	9	9	28	11	6	9	7	9	10	9	33	9	8	9	22	10	10	9	51	10	8	7.0	
2	11	5	10	39	11	6	10	2	9	7	10	38	9	7	10	25	10	6	10	59	10	5	0	
17	11	8	11	52	11	11	11	14	9	8	11	50	9	9	11	32	10	5	—	—	—	—	9.0	
—	—	—	0	25	12	3	0	25	10	0	—	—	—	—	0	4	10	6	0	35	10	9	10.0	
57	12	8	1	26	13	2	1	1	10	3	1	35	10	6	1	9	11	0	1	44	11	4	11.0	
53	13	7	2	20	14	0	2	7	10	10	2	37	11	2	2	18	11	8	2	52	11	11	12.0	
Mean Spring } 7ft. 5in.								5ft. 10in.								6ft. 2in.								

Equation of Time at Noon.

L.	S.	Add.	M.	D.	M.	S.	Add.	M.	D.	M.	S.	Add.	M.	D.	M.	S.	Add.
5	17		9		16	1		17		14	49		25		12	45	
5	18		10		15	55		18		14	36		26		12	26	
5	18		11		15	48		19		14	23		27		12	6	
5	17		12		15	40		20		14	8		28		11	45	
5	16		13		15	32		21		13	53		29		11	24	
5	13		14		15	22		22		13	37		30		11	3	
5	10		15		15	12		23		13	20						
5	6		16		15	1		24		13	3						

High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for GALWAY add 11 m. | QUEENSTOWN add 8 m. | WATERFORD add 3 m.

TIDE TABLES FOR THE

DECEMBER, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BREST.				DEVONPORT.				PORTSMOUTH.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.
		H. M.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.
F.	1	11 55	1 57 18	8	2 22 19	3	3 46 15	1	4 14 15	6	9 52 12	7	10 18 12	10
S.	2	morn.	2 47 19	9	3 13 20	0	4 41 15	8	5 7 15	11	10 44 13	0	11 9 13	
S.	3	0 5	3 38 20	2	4 22 20	2	5 33 16	1	5 58 16	0	11 33 13	2	11 58 13	
M.	4	1 5	4 26 20	1	4 48 19	10	6 22 16	3	6 45 15	10	—	—	0 23 13	
Tu.	5	2 3	5 11 19	6	5 32 19	1	7 6 16	1	7 26 15	5	0 47 13	0	1 10 12	
W.	6	2 58	5 54 18	7	6 16 18	0	7 47 15	8	8 8 14	9	1 33 12	8	1 55 12	
Th.	7	3 50	6 39 17	4	7 2 16	9	8 28 15	0	8 47 13	11	2 17 12	2	2 40 11	
F.	8	4 38	7 26 16	0	7 49 15	4	9 7 14	1	9 28 13	0	3 2 11	7	3 25 11	
S.	9	5 23	8 13 14	10	8 39 14	3	9 50 13	2	10 14 12	4	3 47 11	0	4 10 10	
S.	10	6 7	9 5 13	11	9 36 13	9	10 39 12	6	11 5 11	10	4 35 10	6	5 0 10	
M.	11	6 50	10 10 13	7	10 48 13	7	11 37 12	2	—	—	5 29 10	1	6 2 9	
Tu.	12	7 32	11 22 13	9	11 55 13	11	0 12 11	11	0 49 12	4	6 37 9	11	7 10 10	
W.	13	8 15	—	—	0 25 14	2	1 23 12	4	1 54 12	8	7 42 10	2	8 14 10	
Th.	14	8 59	0 54 14	7	1 20 15	0	2 25 12	9	2 53 13	1	8 45 10	7	9 11 10	
F.	15	9 45	1 42 15	6	2 2 16	0	3 20 13	4	3 44 13	7	9 34 11	1	9 56 11	
S.	16	10 33	2 21 16	5	2 40 16	11	4 8 13	10	4 30 14	0	10 16 11	6	10 36 11	
S.	17	11 22	2 59 17	4	3 19 17	8	4 51 14	5	5 11 14	5	10 55 11	10	11 14 11	
M.	18	0 13	3 37 17	10	3 56 18	0	5 30 14	10	5 49 14	7	11 33 12	0	11 52 12	
Tu.	19	1 4	4 16 18	1	4 34 18	2	6 8 15	2	6 27 14	9	—	—	0 12 12	
W.	20	1 55	4 52 18	3	5 11 18	3	6 45 15	3	7 2 14	8	0 32 12	2	0 52 12	
Th.	21	2 46	5 30 18	2	5 49 18	1	7 20 15	2	7 39 14	6	1 11 12	2	1 31 12	
F.	22	3 37	6 9 17	11	6 30 17	8	7 58 15	0	8 18 14	3	1 50 12	2	2 10 12	
S.	23	4 27	6 52 17	4	7 16 16	11	8 38 14	7	8 59 13	9	2 31 12	0	2 53 11	
S.	24	5 17	7 41 16	6	8 6 16	1	9 22 14	2	9 47 13	5	3 16 11	9	3 40 11	
M.	25	6 7	8 33 15	8	9 3 15	4	10 13 13	8	10 42 13	1	4 4 11	4	4 30 11	
Tu.	26	7 0	9 35 15	2	10 11 15	2	11 12 13	3	11 45 12	11	4 59 11	0	5 29 10	
W.	27	7 54	10 49 15	3	11 29 15	5	—	—	0 24 13	3	6 3 10	9	6 38 10	
Th.	28	8 50	—	—	0 7 15	9	1 3 13	3	1 43 13	7	7 17 10	10	7 55 11	
F.	29	9 48	0 41 16	3	1 14 16	9	2 21 13	9	2 55 14	1	8 31 11	5	9 5 11	
S.	30	10 47	1 42 17	4	2 10 18	0	3 28 14	5	3 57 14	8	9 36 12	0	10 5 12	
S.	31	11 46	2 36 18	6	3 0 19	0	4 25 15	2	4 53 15	2	10 32 12	5	10 57 12	
Half Mean Spring } Range.			9 ^{ft.} 6 ^{in.}				7 ^{ft.} 9 ^{in.}				6 ^{ft.} 4 ^{in.}			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D. ° ' "							
Full - - - - -	3	6 44	Afternoon.				1	15 N. 34	9	4 N. 15	17	18 S. 35	25	28 S. 33
Last Quarter -	10	0 13	Morning.				2	17 44	10	0 24	18	18 40	26	6 55
New- - - - -	18	4 45	Morning.				3	18 41	11	3 8. 24	19	17 50	27	10 57
First Quarter -	25	0 31	Afternoon.				4	18 22	12	7 3	20	16 5	28	14 23
							5	16 56	13	10 25	21	13 28	29	16 56
In Perigee - -	1	4 0	Morning.				6	14 34	14	13 23	22	10 7	30	18 24
In Apogee - -	13	3 0	Morning.				7	11 31	15	15 49	23	6 12	31	18 41
In Perigee - -	29	3 0	Morning.				8	8 0	16	17 36	24	1 55		

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
 BREST add 18 m. DEVONPORT add 17 m. PORTSMOUTH add 4 m.

DECEMBER, 1865.

DOVER.					SHEERNESS.					LONDON.					C's Age at Noon.				
MORNING.		AFTERNOON.			MORNING.		AFTERNOON.			MORNING.		AFTERNOON.							
Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.		Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.		Time. H. M.	Height. F. L.	Time. H. M.	Height. F. L.						
9 15	18 5	9 42	18 10		11 4	15 9	11 30	16 1		0 5	18 0	0 33	18 4	13'0					
10 10	19 2	10 38	19 5		11 55	16 4	—	—		1 1	18 9	1 26	19 1	○					
11 5	19 6	11 31	19 6		0 20	16 7	0 46	16 8		1 50	19 5	2 14	19 7	15'0					
11 57	19 5	—	—		1 10	16 9	1 34	16 9		2 39	19 9	3 3	19 10	16'0					
0 22	19 3	0 47	19 1		1 57	16 8	2 19	16 6		3 26	19 10	3 49	19 8	17'0					
1 11	18 10	1 35	18 6		2 41	16 4	3 2	16 1		4 11	19 6	4 34	19 3	18'0					
1 58	18 1	2 21	17 7		3 24	15 9	3 46	15 5		4 55	18 11	5 17	18 7	19'0					
2 43	17 1	3 6	16 7		4 9	15 0	4 32	14 7		5 39	18 3	6 2	17 10	20'0					
3 28	16 1	3 51	15 8		4 56	14 3	5 20	13 11		6 26	17 5	6 50	17 0	21'0					
4 14	15 2	4 37	14 9		5 46	13 8	6 15	13 4		7 15	16 8	7 41	16 4	⊕					
5 4	14 6	5 33	14 4		6 44	13 1	7 16	13 0		8 11	16 1	8 45	15 11	23'0					
6 4	14 3	6 36	14 5		7 52	13 0	8 29	13 1		9 19	15 10	9 54	15 9	24'0					
7 8	14 8	7 40	14 11		9 1	13 3	9 33	13 6		10 27	15 10	11 0	15 11	25'0					
8 10	15 3	8 35	15 7		10 2	13 9	10 30	13 11		11 29	16 1	11 56	16 3	26'0					
8 57	15 11	9 19	16 3		10 54	14 1	11 16	14 4		—	—	0 22	16 6	27'0					
9 40	16 7	10 1	16 11		11 35	14 7	11 54	14 9		0 45	16 9	1 5	17 1	28'0					
10 22	17 2	10 43	17 5		—	—	0 13	15 0		1 25	17 4	1 44	17 7	29'0					
11 3	17 7	11 24	17 9		0 32	15 2	0 51	15 4		2 4	17 10	2 21	18 1	●					
11 45	17 10	—	—		1 10	15 5	1 28	15 6		2 40	18 3	2 58	18 5	1'3					
0 6	18 0	0 26	18 1		1 47	15 7	2 5	15 7		3 16	18 7	3 33	18 8	2'3					
0 46	18 1	1 7	18 1		2 24	15 7	2 42	15 7		3 51	18 9	4 10	18 9	3'3					
1 29	18 0	1 50	17 11		3 0	15 6	3 19	15 5		4 30	18 8	4 50	18 7	4'3					
2 12	17 9	2 34	17 7		3 39	15 4	4 1	15 2		5 11	18 6	5 32	18 4	5'3					
2 57	17 3	3 21	17 0		4 23	15 0	4 46	14 9		5 55	18 2	6 17	17 11	6'3					
3 45	16 8	4 11	16 4		5 11	14 6	5 37	14 4		6 42	17 8	7 8	17 6	7'3					
4 38	16 0	5 5	15 8		6 7	14 1	6 41	13 11		7 36	17 3	8 7	17 0	8'3					
5 35	15 7	6 7	15 10		7 15	13 10	7 52	13 10		8 42	16 11	9 19	16 10	9'3					
6 43	16 1	7 21	16 2		8 30	14 0	9 8	14 3		9 56	16 9	10 34	16 11	10'3					
7 56	16 7	8 29	17 0		9 44	14 6	10 17	14 10		11 10	17 1	11 44	17 4	11'3					
8 59	17 5	9 28	17 10		10 48	15 2	11 16	15 5		—	—	0 15	17 8	12'3					
9 56	18 3	10 24	18 6		11 43	15 8	—	—		0 44	18 0	1 11	18 4	13'3					
Mean Spring } Range.					9ft. 4in.					8ft. 0in.					9ft. 7in.				

Equation of Time at Noon.

M. S.		M.D.	M. S.		M.D.	M. S.		M.D.	M. S.	
10 40	Add.	9	7 20	Add.	17	3 32	Add.	25	0 28	Sub.
10 17		10	6 53		18	3 2		26	0 58	
9 54		11	6 25		19	2 32		27	1 27	
9 29		12	5 57		20	2 2		28	1 57	
9 5		13	5 28		21	1 32		29	2 26	
8 39		14	5 0		22	1 2		30	2 55	
8 13		15	4 30		23	0 32		31	3 24	
7 47		16	4 1		24	0 2				

1 of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
 Dover subtract 5 m. | SHEERNESS subtract 3 m. | LONDON 0 m.

DECEMBER, 1865.

Week Day.	Month Day.	Moon's Transit.	HARWICH.								HULL.								SUNDERLAND.																						
			MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.																		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.																					
		H. M.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.	H. M. F. I.																						
F.	1	11 25	10 14	11 5	10 41	11 8	4 32	20 5	4 58	20 11	1 25	13 10	1 53	14																											
S.	2	morn.	11 7	11 10	11 33	12 0	5 23	21 3	5 50	21 6	2 19	14 5	2 44	14																											
S.	3	0 5	11 58	12 1	—	—	6 16	21 8	6 41	21 10	3 8	14 10	3 33	15																											
M.	4	1 5	0 22	12 1	0 46	12 0	7 6	21 10	7 30	21 9	3 57	15 1	4 20	15																											
Tu.	5	2 3	1 10	11 11	1 33	11 9	7 52	21 6	8 14	21 3	4 42	14 11	5 4	14																											
W.	6	2 58	1 56	11 7	2 19	11 5	8 37	20 10	9 0	20 4	5 27	14 3	5 51	13																											
Th.	7	3 50	2 42	11 2	3 4	11 0	9 22	19 10	9 44	19 3	6 14	13 5	6 38	13																											
F.	8	4 38	3 27	10 9	3 49	10 7	10 7	18 9	10 32	18 2	7 3	12 9	7 28	12																											
S.	9	5 23	4 11	10 4	4 34	10 2	10 58	17 8	11 28	17 3	7 53	11 11	8 18	11																											
S.	10	6 7	4 59	10 0	5 25	9 10	11 59	16 9	—	—	8 46	11 4	9 15	11																											
M.	11	6 50	5 51	9 9	6 22	9 8	0 29	16 5	0 59	16 3	9 47	11 0	10 21	10																											
Tu.	12	7 32	7 0	9 8	7 37	9 9	1 30	16 2	2 1	16 3	10 55	10 11	11 26	11																											
W.	13	8 15	8 9	9 10	8 40	9 11	2 32	16 5	3 2	16 9	11 54	11 3	—	—																											
Th.	14	8 59	9 10	10 0	9 37	10 2	3 31	17 2	3 59	17 6	0 22	11 5	0 49	11																											
F.	15	9 45	10 3	10 4	10 26	10 6	4 23	17 11	4 45	18 3	1 13	12 0	1 35	12																											
S.	16	10 33	10 46	10 8	11 6	10 10	5 4	18 7	5 22	18 11	1 57	12 6	2 17	12																											
S.	17	11 22	11 26	11 11	11 45	11 1	5 41	19 2	6 1	19 5	2 38	13 0	2 57	13																											
M.	18	0 13	—	—	0 5	11 2	6 21	19 7	6 41	19 9	3 15	13 4	3 33	13																											
Tu.	19	1 4	0 23	11 2	0 41	11 3	7 0	19 11	7 19	20 0	3 52	13 8	4 10	13																											
W.	20	1 55	1 0	11 3	1 20	11 3	7 38	20 1	7 57	20 2	4 28	13 11	4 47	13																											
Th.	21	2 46	1 38	11 2	1 57	11 2	8 15	20 2	8 35	20 1	5 5	13 10	5 25	13																											
F.	22	3 37	2 17	11 1	2 37	11 0	8 54	19 11	9 15	19 9	5 45	13 6	6 0	13																											
S.	23	4 27	2 57	10 11	3 18	10 10	9 37	19 6	9 59	19 2	6 28	13 3	6 52	13																											
S.	24	5 17	3 40	10 9	4 2	10 8	10 22	18 11	10 47	18 7	7 17	12 10	7 43	12																											
M.	25	6 7	4 26	10 6	4 51	10 5	11 16	18 4	11 50	18 0	8 10	12 5	8 39	12																											
Tu.	26	7 0	5 19	10 4	5 49	10 3	—	—	0 26	17 9	9 12	12 0	9 46	11																											
W.	27	7 54	6 21	10 3	6 59	10 3	0 59	17 6	1 32	17 6	10 21	11 10	10 57	11																											
Th.	28	8 50	7 38	10 4	8 16	10 6	2 5	17 7	2 39	17 11	11 33	12 1	—	—																											
F.	29	9 48	8 51	10 8	9 24	10 10	3 13	18 6	3 45	19 0	0 5	12 5	0 36	12																											
S.	30	10 47	9 57	11 0	10 27	11 3	4 17	19 6	4 45	19 11	1 7	13 1	1 37	13																											
S.	31	11 46	10 55	11 5	11 22	11 7	5 11	20 4	5 37	20 7	2 6	13 9	2 34	14																											
Half Mean Spring Range.			5 ft. 9 in.				10 ft. 5 in.				7 ft. 2 in.																														
Phases of the Moon.																					Moon's Declination at Noon.																				
						D. H. M.							M. D.	°	'	M. D.	°	'	M. D.	°	'	M. D.	°	'																	
Full	-	-	2	6	44	Afternoon.	1	15	N. 34	9	4	N. 15	17	18	B. 35	25	25	35	25	25	35	25	25																		
Last Quarter	-	-	10	0	13	Morning.	2	17	44	10	0	24	18	18	40	26	6	5	26	6	5	26	6																		
New	-	-	18	4	45	Morning.	3	18	41	11	3	S. 24	19	17	50	27	10	5	27	10	5	27	10																		
First Quarter	-	-	25	0	31	Afternoon.	4	18	22	12	7	3	20	16	5	28	14	2	28	14	2	28	14																		
In Perigee	-	-	1	4	0	Morning.	5	16	56	13	10	25	21	13	28	29	16	5	29	16	5	29	16																		
In Apogee	-	-	13	3	0	Morning.	6	14	34	14	13	23	22	10	7	30	18	2	30	18	2	30	18																		
In Perigee	-	-	29	3	0	Morning.	7	11	31	15	15	49	23	6	12	31	18	4	31	18	4	31	18																		
							8	8	0	16	17	36	24	1	55																										

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—
 HARWICH subtract 5 m. HULL add 1 m. SUNDERLAND add 8 m.

DECEMBER, 1865.

NORTH SHIELDS.								LEITH.								THURSO.								C's AGE AT NOON.
MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				MORNING.				AFTERNOON.				
Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			Time.	Height.			
I. M. F. I.				H. M. F. I.				H. M. F. I.				H. M. F. I.				H. M. F. I.				H. M. F. I.				
1 32 12 7				1 57 13 0				0 26 15 6				0 52 16 0				6 49 12 10				7 10 13 4				13.0
2 22 13 4				2 46 13 7				1 17 16 5				1 42 16 9				7 32 13 9				7 56 14 0				0
3 9 13 9				3 33 13 11				2 7 17 0				2 31 17 1				8 19 14 1				8 42 14 0				15.0
3 57 13 11				4 21 13 10				2 54 17 1				3 16 16 11				9 5 13 11				9 28 13 8				16.0
4 44 13 7				5 8 13 4				3 39 16 8				4 2 16 5				9 52 13 4				10 15 13 0				17.0
5 31 13 0				5 55 12 8				4 25 16 1				4 48 15 9				10 39 12 7				11 3 12 2				18.0
5 18 12 4				6 41 12 0				5 11 15 4				5 36 14 11				11 28 11 9				11 53 11 4				19.0
7 5 11 8				7 31 11 3				6 1 14 6				6 26 14 0				— — —				0 18 10 10				20.0
7 57 10 10				8 25 10 5				6 51 13 7				7 19 13 3				0 43 10 6				1 10 10 2				21.0
8 56 10 2				9 27 9 11				7 50 12 11				8 20 12 8				1 40 9 10				2 11 9 7				22.0
9 0 9 10				10 33 9 10				8 52 12 6				9 27 12 6				2 44 9 6				3 23 9 5				23.0
1 7 9 11				11 39 10 1				10 1 12 6				10 32 12 7				4 0 9 4				4 32 9 5				24.0
— — —				0 8 10 3				11 1 12 9				11 29 13 0				5 3 9 6				5 31 9 7				25.0
2 36 10 5				1 1 10 7				11 57 13 3				— — —				5 57 9 10				6 20 10 3				26.0
1 24 10 10				1 44 11 1				0 18 13 6				0 38 13 10				6 39 10 7				6 55 11 0				27.0
2 3 11 4				2 21 11 7				0 57 14 2				1 16 14 6				7 12 11 4				7 28 11 9				28.0
2 40 11 10				2 58 12 1				1 36 14 10				1 55 15 1				7 45 12 1				8 2 12 4				29.0
3 16 12 3				3 34 12 5				2 14 15 4				2 32 15 6				8 20 12 6				8 38 12 7				30.0
3 52 12 7				4 11 12 8				2 50 15 7				3 7 15 8				8 56 12 7				9 14 12 7				1.3
4 30 12 8				4 49 12 7				3 25 15 8				3 44 15 7				9 33 12 7				9 52 12 6				2.3
5 8 12 6				5 28 12 5				4 3 15 6				4 23 15 5				10 13 12 5				10 34 12 3				3.3
5 49 12 4				6 10 12 3				4 44 15 4				5 4 15 3				10 55 12 1				11 18 11 11				4.3
5 32 12 2				6 55 12 0				5 26 15 1				5 50 14 11				11 42 11 8				— — —				5.3
7 19 11 9				7 46 11 6				6 16 14 8				6 42 14 4				0 7 11 5				0 34 11 2				6.3
8 15 11 3				8 46 11 0				7 10 14 1				7 42 13 10				1 1 11 0				1 32 10 10				7.3
9 21 10 10				9 58 10 9				8 16 13 8				8 51 13 6				2 7 10 7				2 43 10 6				8.3
10 34 10 10				11 10 10 11				9 28 13 6				10 4 13 7				3 22 10 5				4 2 10 5				9.3
1 46 11 2				— — —				10 39 13 9				11 12 14 1				4 39 10 6				5 14 10 8				10.3
2 19 11 5				0 49 11 8				11 42 14 4				— — —				5 44 11 0				6 15 11 5				11.3
1 18 11 11				1 45 12 2				0 12 14 9				0 39 15 1				6 39 11 11				7 3 12 5				12.3
2 11 12 6				2 36 12 10				1 5 15 6				1 32 15 11				7 25 12 10				7 47 13 2				13.3
Mean Spring } 6ft. 8in. Range.								8ft. 2in.								6ft. 7in.								

Equation of Time at Noon.

M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Add.	M. D.	M. S.	Sub.
10 40		9	7 20		17	3 32		25	0 28	
10 17		10	6 53		18	3 2		26	0 58	
9 54		11	6 25		19	2 32		27	1 27	
9 29		12	5 57		20	2 2		28	1 57	
9 5		13	5 28		21	1 32		29	2 26	
8 39		14	5 0		22	1 2		30	2 55	
8 13		15	4 30		23	0 32		31	3 24	
7 47		16	4 1		24	0 2				

of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for
NORTH SHIELDS add 6 m. LEITH add 13 m. THURSO add 14 m.

DECEMBER, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRAMIT.	GREENOCK.				LIVERPOOL.				PEMBROKE.				
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		
			Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	
			H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	H. M.	F. I.	
F.	1	11a 5	10 12	■	7	10 39	9 9	9 31	25 9	9 56	26 3	4 14	20 6	4 43	21 1
S.	2	morn.	11 7	9 10	11 34	9 11	10 21	26 8	10 47	26 11	5 11	21 6	5 39	21 5	
●	3	0 5	12 0	10 0	—	—	11 13	27 2	11 37	27 2	6 4	22 0	6 28	22 3	
M.	4	1 5	0 25	10 0	0 50	10 0	—	—	0 127	1 6	52 22	0	7 15	21 1	
Tu.	5	2 3	1 14	10 0	1 37	9 11	0 24	26 11	0 46	26 6	7 37	21 5	7 59	21 6	
W.	6	2 58	1 59	9 10	2 21	9 8	1 8	26 0	1 30	25 4	8 22	20 0	8 44	19 11	
Th.	7	3 50	2 42	9 6	3 4	9 4	1 52	24 8	2 14	24 0	9 6	19 4	9 27	18 9	
F.	8	4 38	3 26	9 3	3 48	9 1	2 36	23 4	2 59	22 7	9 48	18 1	10 8	17 8	
S.	9	5 23	4 10	8 11	4 34	8 9	3 22	21 11	3 46	21 4	10 29	16 11	10 51	16 4	
●	10	6 7	4 59	■	7	5 25	8 5	4 14	20 8	4 43	20 2	11 13	15 9	11 40	15 8
M.	11	6 50	5 55	■	3	6 28	8 2	5 16	20 0	5 53	19 11	—	—	0 10	15 3
Tu.	12	7 32	7 3	8 2	7 35	8 2	6 32	20 0	7 5	20 3	0 44	15 4	1 21	15 3	
W.	13	8 15	8 7	8 3	8 37	8 4	7 36	20 6	8 6	20 10	1 56	15 8	2 29	16 0	
Th.	14	8 59	9 7	8 6	9 33	8 7	8 33	21 4	8 57	21 9	3 1	16 5	3 28	16 11	
F.	15	9 45	9 55	8 9	10 17	8 10	9 18	22 4	9 37	22 9	3 53	17 5	4 16	17 10	
S.	16	10 33	10 37	8 11	10 58	9 0	9 56	23 3	10 15	23 7	4 39	18 4	5 2	18 9	
●	17	11 22	11 19	9 1	11 40	9 2	10 34	23 11	10 53	24 2	5 24	19 1	5 45	19 4	
M.	18	on 13	12 0	9 3	—	—	11 12	24 6	11 32	24 8	6 4	19 7	6 23	19 11	
Tu.	19	1 4	0 20	9 4	0 39	9 5	11 51	24 10	—	—	6 42	20 0	7 0	20 2	
W.	20	1 55	0 59	9 6	1 18	9 6	0 10	25 0	0 29	25 1	7 19	20 2	7 38	20 2	
Th.	21	2 46	1 37	9 6	1 56	9 6	0 48	25 1	1 7	25 0	7 57	20 1	8 17	20 5	
F.	22	3 37	2 15	9 6	2 35	9 6	1 26	24 9	1 45	24 6	8 37	19 10	8 58	19 8	
S.	23	4 27	2 56	9 5	3 17	9 4	2 6	24 3	2 28	23 11	9 19	19 3	9 40	18 10	
●	24	5 17	3 39	9 3	4 3	9 2	2 50	23 7	3 14	23 1	10 2	18 7	10 25	18 4	
M.	25	6 7	4 27	9 1	4 54	9 0	3 38	22 9	4 7	22 4	10 49	17 10	11 14	17 8	
Tu.	26	7 0	5 24	8 11	5 55	8 9	4 40	21 11	5 14	21 8	11 41	17 0	—	—	
W.	27	7 54	6 29	8 8	7 4	8 7	5 52	21 8	6 33	21 10	0 11	16 11	0 45	16 11	
Th.	28	8 50	7 42	■	9	8 19	8 10	7 12	22 2	7 47	22 8	1 28	17 1	2 9	17 5
F.	29	9 48	8 54	■	0	9 27	9 2	8 20	23 2	8 51	23 10	2 46	18 0	3 22	18 5
S.	30	10 47	9 57	9 3	10 26	9 5	9 18	24 5	9 45	25 0	3 55	19 3	4 27	19 10	
●	31	11 46	10 54	9 6	11 21	9 7	10 10	25 5	10 35	25 9	4 57	20 4	5 25	20 8	
Half Mean Spring Range.			4ft. 10in.				13ft. 0in.				10ft. 6in.				
Phases of the Moon.							Moon's Declination at Noon.								
D. H. M.							M.D.	°	'	M.D.	°	'	M.D.	°	'
Full	—	—	2	6	44	Afternoon.	1	15	N. 34	9	4	N. 15	17	18	S. 35
Last Quarter	—	—	10	0	13	Morning.	2	17	44	10	0	24	18	18	40
New	—	—	18	4	45	Morning.	3	18	41	11	3	S. 24	19	17	50
First Quarter	—	—	25	0	31	Afternoon.	4	18	22	12	7	3	20	16	5
In Perigee	—	—	1	4	0	Morning.	5	16	56	13	10	25	21	13	28
In Apogee	—	—	13	3	0	Morning.	6	14	34	14	13	23	—	10	7
In Perigee	—	—	29	3	0	Morning.	7	11	31	15	15	49	23	6	12
							8	8	0	16	17	36	24	1	55

The times of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required, —
 GREENOCK add 19 m. LIVERPOOL add 12 m. PEMBROKE add 22 m.

DECEMBER, 1865.

WESTON-SUPER-MARE.												HOLYHEAD.												KINGSTOWN.												C's Age AT NOON.
MORNING.						AFTERNOON.						MORNING.						AFTERNOON.						MORNING.						AFTERNOON.						
Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	D.										
L. M. F. I.	L. M. F. I.	H. M. F. I.	H. M. F. I.	L. M. F. I.	L. M. F. I.	H. M. F. I.	H. M. F. I.	L. M. F. I.	L. M. F. I.	H. M. F. I.	H. M. F. I.	L. M. F. I.	L. M. F. I.	H. M. F. I.	H. M. F. I.	L. M. F. I.	L. M. F. I.	H. M. F. I.	H. M. F. I.	L. M. F. I.	L. M. F. I.	H. M. F. I.	H. M. F. I.	L. M. F. I.	L. M. F. I.											
4 55 36 5		5 24 37 3		8 27 15 11		8 52 16 2		9 26 10 9		9 51 11 0		13° 0																								
5 52 38 0		6 20 38 5		9 16 16 5		9 41 16 7		10 14 11 3		10 37 11 3		○																								
6 47 38 9		7 12 39 0		10 5 16 9		10 26 16 9		11 1 11 5		11 25 11 4		15° 0																								
7 36 38 11		7 58 38 6		10 48 16 8		11 9 16 6		11 49 11 3		—		16° 0																								
8 20 38 1		8 41 37 6		11 32 16 3		11 56 15 11		0 12 11 2		0 36 11 0		17° 0																								
9 13 36 10		9 21 35 11		—		0 21 15 7		0 59 10 10		1 23 10 7		18° 0																								
9 41 34 11		9 59 34 0		0 45 15 2		1 10 14 9		1 46 10 4		2 10 10 1		19° 0																								
0 17 32 10		10 36 31 10		1 35 14 4		2 0 13 11		2 34 9 11		2 58 9 8		20° 0																								
0 56 30 11		11 20 30 0		2 24 13 7		2 51 13 3		3 23 9 5		3 50 9 3		21° 0																								
1 45 29 2		—		3 21 12 11		3 52 12 8		4 19 9 1		4 49 8 11		○																								
0 15 28 9		0 47 28 5		4 25 12 7		5 0 12 6		5 19 8 10		5 51 8 9		23° 0																								
1 22 28 5		1 56 28 6		5 34 12 7		6 6 12 9		6 22 8 10		6 53 8 11		24° 0																								
2 29 28 10		3 2 29 3		6 35 12 10		7 3 13 0		7 22 9 1		7 50 9 2		25° 0																								
3 35 29 10		4 5 30 6		7 29 13 3		7 53 13 6		8 18 9 4		8 45 9 6		26° 0																								
4 31 31 3		4 56 32 1		8 14 13 10		8 33 14 1		9 8 9 8		9 30 9 9		27° 0																								
5 20 32 9		5 43 33 6		8 51 14 4		9 9 14 7		9 50 9 11		10 9 10 1		28° 0																								
6 5 34 1		6 26 34 6		9 28 14 9		9 47 15 0		10 27 10 3		10 44 10 4		29° 0																								
6 46 34 10		7 6 35 3		10 5 15 1		10 22 15 3		11 2 10 6		11 20 10 7		●																								
7 26 35 8		7 45 35 10		10 39 15 4		10 56 15 5		11 38 10 7		11 59 10 7		1° 3																								
8 3 36 0		8 20 36 0		11 14 15 5		11 33 15 5		—		0 17 10 7		2° 3																								
8 38 36 0		8 57 35 11		11 53 15 4		—		0 37 10 6		0 57 10 6		3° 3																								
9 15 35 9		9 34 35 4		0 15 15 3		0 37 15 1		1 18 10 5		1 39 10 4		4° 3																								
9 53 34 10		10 12 34 4		1 0 14 11		1 24 14 9		2 1 10 2		2 24 10 1		5° 3																								
10 31 33 8		10 52 33 0		1 49 14 6		2 15 14 3		2 49 10 0		3 14 9 10		6° 3																								
11 16 32 4		11 44 31 8		2 42 14 1		3 13 13 10		3 40 9 9		4 12 9 7		7° 3																								
—		0 15 31 2		3 48 13 8		4 24 13 6		4 46 9 5		5 19 9 4		8° 3																								
0 48 30 11		1 24 31 0		5 1 13 7		5 37 13 8		5 52 9 4		6 26 9 5		9° 3																								
2 3 31 3		2 42 31 10		6 12 13 11		6 46 14 2		7 0 9 7		7 33 9 9		10° 3																								
3 21 32 6		3 59 33 5		7 17 14 5		7 47 14 9		8 6 9 11		8 39 10 2		11° 3																								
4 34 34 4		5 8 35 4		8 14 15 1		8 40 15 5		9 10 10 4		9 39 10 6		12° 3																								
5 38 36 1		6 6 36 9		9 5 15 8		9 29 15 11		10 5 10 8		10 28 10 10		13° 3																								
Mean Spring Range. } 18ft. 7in.												8ft. 0in.												5ft. 6in.												

Equation of Time at Noon.

M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Sub.
10 40		9	7 20		17	3 32		25	0 28	
10 17		10	6 53		18	3 2		26	0 58	
9 54		11	6 25		19	2 32		27	1 27	
9 29		12	5 57		20	2 2		28	1 57	
9 5		13	5 28		21	1 32		29	2 26	
8 39		14	5 0		22	1 2		30	2 55	
8 13		15	4 30		23	0 32		31	3 24	
7 47		16	4 1		24	0 2				

s of High Water are given for Mean Time at Place; if Greenwich or Railway Time be required,—for WESTON-SUPER-MARE add 12 m. | HOLYHEAD add 12 m. | KINGSTOWN subtract 1 m. for Dublin Time.

DECEMBER, 1865.

WEEK DAY.	MONTH DAY.	MOON'S TRANSIT.	BELFAST.				LONDONDERRY.				SLIGO BAY.			
			MORNING.		AFTERNOON.		MORNING.		AFTERNOON.		MORNING.		AFTERNOON.	
			Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.	Time. H. M.	Height. F. I.
F.	1	11 18 5	9 2	9 5	9 27	9 7	6 12	7 8	6 38	7 10	3 29	10 11	3 53	
S.	2	morn.	9 52	9 8	10 16	9 9	7 4	8 0	7 30	8 1	4 18	11 6	4 4	
S.	3	0 5	10 40	9 9	11 4	9 9	7 54	8 2	8 17	8 2	5 10	11 9	5 34	
M.	4	1 5	11 26	9 8	11 48	9 7	8 38	8 1	8 59	7 11	5 56	11 9	6 18	
Tu.	5	2 3	—	—	0 11	9 6	9 20	7 8	9 41	7 6	6 41	11 3	7 4	
W.	6	2 58	0 35	9 5	1 0	9 4	10 3	7 3	10 25	7 0	7 26	10 7	7 48	
Th.	7	3 50	1 25	9 2	1 50	9 0	10 49	6 9	11 16	6 6	8 11	9 10	8 35	
F.	8	4 38	2 15	8 10	2 41	8 8	11 46	6 3	—	—	9 2	9 3	9 29	
S.	9	5 23	3 6	8 6	3 33	8 4	0 18	5 11	0 52	5 9	9 59	8 8	10 30	
S.	10	6 7	4 1	8 3	4 30	8 2	1 27	5 8	2 4	5 7	11 1	8 4	11 33	
M.	11	6 50	5 0	8 1	5 32	8 0	2 37	5 7	3 10	5 9	—	—	0 5	
Tu.	12	7 32	6 5	8 0	6 37	8 0	3 41	5 10	4 9	6 0	0 39	8 3	1 11	
W.	13	8 15	7 8	8 0	7 37	8 1	4 34	6 1	4 57	6 3	1 41	8 6	2 9	
Th.	14	8 59	8 4	8 2	8 27	8 4	5 19	6 4	5 39	6 5	2 36	8 10	2 58	
F.	15	9 45	8 47	8 6	9 7	8 5	5 58	6 7	6 17	6 8	3 18	9 4	3 35	
S.	16	10 33	9 26	8 10	9 45	8 11	6 36	6 10	6 56	6 11	3 53	9 10	4 11	
S.	17	11 23	10 4	9 0	10 23	9 1	7 17	7 0	7 36	7 2	4 30	10 3	4 49	
M.	18	0 13	10 41	9 2	10 59	9 2	7 55	7 3	8 13	7 4	5 9	10 7	5 29	
Tu.	19	1 4	11 17	9 2	11 34	9 2	8 30	7 4	8 47	7 4	5 47	10 9	6 4	
W.	20	1 55	11 52	9 3	—	—	9 4	7 4	9 21	7 3	6 22	10 9	6 42	
Th.	21	2 46	0 12	9 3	0 33	9 3	9 39	7 2	9 58	7 1	7 2	10 7	7 22	
F.	22	3 37	0 54	9 2	1 16	9 2	10 18	7 0	10 40	6 11	7 42	10 2	8 3	
S.	23	4 27	1 39	9 1	2 4	9 0	11 5	6 9	11 32	6 7	8 25	9 10	8 50	
S.	24	5 17	2 30	8 11	2 57	8 10	—	—	0 3	6 4	9 18	9 5	9 47	
M.	25	6 7	3 24	8 8	3 54	8 7	0 37	6 2	1 15	6 1	10 21	9 2	10 57	
Tu.	26	7 0	4 27	8 6	5 0	8 5	1 56	6 1	2 35	6 1	11 32	9 0	—	
W.	27	7 54	5 33	8 5	6 7	8 5	3 11	6 3	3 44	6 5	0 6	9 0	0 41	
Th.	28	8 50	6 44	8 5	7 19	8 6	4 16	6 8	4 43	6 10	1 18	9 3	1 52	
F.	29	9 48	7 50	8 7	8 20	8 10	5 8	7 0	5 33	7 1	2 23	9 8	2 52	
S.	30	10 47	8 48	9 0	9 15	9 2	5 58	7 3	6 25	7 5	3 18	10 3	3 43	
S.	31	11 46	9 41	9 4	10 6	9 6	6 52	7 7	7 18	7 8	4 7	10 10	4 31	
Half Mean Spring Range.			4 ft. 9 in.				3 ft. 10 in.				5 ft. 7 in.			
Phases of the Moon.							Moon's Declination at Noon.							
D. H. M.							M.D. ° '							
Full - - - - - 2 6 44 Afternoon.							1 15 N. 34 9 4 N. 15 17 18 S. 35 25 2							
Last Quarter - 10 0 13 Morning.							2 17 44 10 0 24 18 18 40 26 6							
New - - - - - 18 4 45 Morning.							3 18 41 11 38. 24 19 17 50 27 10							
First Quarter - 25 0 31 Afternoon.							4 18 22 12 7 3 20 16 5 28 14							
							5 16 56 13 10 25 21 13 28 29 16							
In Perigee - - 1 4 0 Morning.							6 14 34 14 13 23 22 10 7 30 18							
In Apogee - - 13 3 0 Morning.							7 11 31 15 15 49 23 6 12 31 16							
In Perigee - - 29 3 0 Morning.							8 8 0 16 17 36 24 1 55							

The times of High Water are given for Mean Time at Place; if Dublin or Railway Time be required
 BELFAST subtract 3 m. † LONDONDERRY add 4 m. ‡ SLIGO BAY add 9 m.

DECEMBER, 1865.

GALWAY.					QUEENSTOWN.					WATERFORD.					C's Age at Noon.								
MORNING.			AFTERNOON.		MORNING.			AFTERNOON.		MORNING.		AFTERNOON.											
no.	Height.		Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	Time.	Height.	D								
M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.	H.	M.	F.	I.									
47	14	5	3	13	14	9	3	6	11	6	3	33	11	9	3	24	12	3	3	53	12	6	13.0
38	15	1	4	3	15	4	4	0	12	0	4	27	12	2	4	22	12	9	4	50	12	10	○
27	15	6	4	51	15	7	4	53	12	3	5	18	12	3	5	15	12	11	5	39	12	11	15.0
16	15	7	5	40	15	5	5	43	12	3	6	6	12	2	6	3	12	11	6	26	12	10	16.0
3	15	1	6	25	14	9	6	29	12	0	6	51	11	9	6	49	12	9	7	11	12	7	17.0
49	14	4	7	12	13	11	7	13	11	6	7	35	11	2	7	33	12	4	7	54	12	1	18.0
35	13	6	7	59	13	0	7	57	10	11	8	17	10	7	8	15	11	11	8	35	11	7	19.0
24	12	5	8	48	11	11	8	38	10	3	9	0	10	0	8	55	11	3	9	14	11	0	20.0
13	11	6	9	41	11	2	9	22	9	8	9	45	9	5	9	37	10	9	10	4	10	5	21.0
9	10	10	10	41	10	9	10	9	9	3	10	39	9	1	10	32	10	1	11	1	9	11	⊕
15	10	9	11	51	10	9	11	13	9	0	11	49	9	0	11	32	9	10	—	—	—	—	23.0
—	—	—	0	23	10	11	—	—	—	—	0	21	9	1	0	3	9	9	0	34	9	10	24.0
53	11	1	1	21	11	3	0	53	9	2	1	25	9	4	1	4	9	11	1	34	10	0	25.0
47	11	7	2	10	11	11	1	57	9	6	2	24	9	8	2	6	10	3	2	35	10	6	26.0
32	12	2	2	52	12	6	2	47	9	11	3	9	10	2	3	1	10	8	3	25	10	11	27.0
12	12	9	3	31	13	0	3	31	10	4	3	52	10	7	3	49	11	1	4	12	11	4	28.0
50	13	3	4	9	13	6	4	13	10	9	4	33	10	11	4	35	11	6	4	56	11	7	29.0
28	13	9	4	46	13	11	4	52	11	1	5	12	11	2	5	15	11	■	5	34	11	10	●
5	14	1	5	24	14	2	5	32	11	3	5	51	11	4	5	53	11	11	6	12	12	0	1.3
44	14	2	6	3	14	2	6	10	11	4	6	29	11	4	6	31	12	0	6	50	12	1	2.3
23	14	1	6	43	14	0	6	49	11	4	7	8	11	3	7	10	12	1	7	29	12	1	3.3
4	13	10	7	26	13	8	7	28	11	2	7	49	11	0	7	48	12	0	8	8	12	0	4.3
49	13	5	8	14	13	2	8	10	10	10	8	31	10	8	8	28	11	10	8	49	11	8	5.3
39	12	9	9	5	12	6	8	53	10	6	9	16	10	4	9	9	11	6	9	30	11	4	6.3
33	12	2	10	6	■	0	9	41	10	2	10	9	10	0	9	57	11	2	10	29	10	11	7.3
40	11	10	11	16	11	11	10	39	9	10	11	14	9	10	11	1	10	9	11	33	10	7	8.3
53	12	0	—	—	—	—	11	50	9	10	—	—	—	—	—	—	—	—	0	6	10	6	9.3
30	12	2	1	4	12	6	0	28	9	11	1	6	10	1	0	40	10	8	1	15	10	10	10.3
34	12	10	2	4	13	2	1	43	10	4	2	18	10	7	1	51	11	1	2	29	11	5	11.3
33	13	7	3	1	13	11	2	49	10	10	3	19	11	2	3	4	11	8	3	37	11	11	12.3
27	14	3	3	52	14	6	3	48	11	4	4	14	11	7	4	7	12	2	4	36	12	4	13.3
at Spring } ages.			7ft. 5in.			5ft. 10in.			6ft. 2in.														

Equation of Time at Noon.

A.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Add.	M.D.	M. S.	Sub.
40		9	7 20		17	3 32		25	0 28	
17		10	6 53		18	3 2		26	0 58	
54		11	6 25		19	2 32		27	1 27	
29		12	5 57		20	2 2		28	1 57	
5		13	5 28		21	1 32		29	2 26	
39		14	5 0		22	1 2		30	2 55	
13		15	4 30		23	0 32		31	3 24	
47		16	4 1		24	0 2				

if High Water are given for Mean Time at Place; if Dublin or Railway Time be required,—for
 GALWAY add 11 m. QUEENSTOWN add 8 m. WATERFORD add 3 m.

TABLE (B.)—For finding the Height of the Tide at any intermediate Hour between High and Low Water.

Height above Half-tide or Mean Level of the Sea.	Time from High Water.													
	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
	0 00	0 30	1 0	1 30	2 0	2 30	3 0	3 30	4 0	4 30	5 0	5 30	6	
Add							Subtract							
Feet.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
3	3 0	2 11	2 7	2 1	1 6	0 9	0 0	0 9	1 6	2 1	2 7	2 11	3	
4	4 0	3 10	3 6	2 10	2 0	1 0	0 0	1 0	2 0	2 10	3 6	3 10	4	
5	5 0	4 10	4 4	3 6	2 6	1 3	0 0	1 3	2 6	3 6	4 4	4 10	5	
6	6 0	5 10	5 2	4 3	3 0	1 7	0 0	1 7	3 0	4 3	5 2	5 10	6	
7	7 0	6 9	6 1	4 11	3 6	1 10	0 0	1 10	3 6	4 11	6 1	6 9	7	
8	8 0	7 9	6 11	5 8	4 0	2 1	0 0	2 1	4 0	5 8	6 11	7 9	8	
9	9 0	8 8	7 9	6 4	4 6	2 4	0 0	2 4	4 6	6 4	7 9	8 8	9	
10	10 0	9 8	8 8	7 1	5 0	2 7	0 0	2 7	5 0	7 1	8 8	9 8	10	
11	11 0	10 8	9 6	7 9	5 6	2 10	0 0	2 10	5 6	7 9	9 6	10 8	11	
12	12 0	11 7	10 5	8 6	6 0	3 1	0 0	3 1	6 0	8 6	10 5	11 7	12	
13	13 0	12 7	11 3	9 2	6 6	3 4	0 0	3 4	6 6	9 2	11 3	12 7	13	
14	14 0	13 6	12 1	9 11	7 0	3 7	0 0	3 7	7 0	9 11	12 1	13 6	14	
15	15 0	14 6	13 0	10 7	7 6	3 11	0 0	3 11	7 6	10 7	13 0	14 6	15	
16	16 0	15 5	13 10	11 4	8 0	4 2	0 0	4 2	8 0	11 4	13 10	15 5	16	
17	17 0	16 5	14 9	12 0	8 6	4 5	0 0	4 5	8 6	12 0	14 9	16 5	17	
18	18 0	17 5	15 7	12 9	9 0	4 8	0 0	4 8	9 0	12 9	15 7	17 5	18	
19	19 0	18 4	16 5	13 5	9 6	4 11	0 0	4 11	9 6	13 5	16 5	18 4	19	
20	20 0	19 4	17 4	14 2	10 0	5 2	0 0	5 2	10 0	14 2	17 4	19 4	20	
21	21 0	20 3	18 2	14 10	10 6	5 5	0 0	5 5	10 6	14 10	18 2	20 3	21	
22	22 0	21 3	19 1	15 7	11 0	5 8	0 0	5 8	11 0	15 7	19 1	21 3	22	
23	23 0	22 3	19 11	16 3	11 6	5 11	0 0	5 11	11 6	16 3	19 11	22 3	23	
24	24 0	23 2	20 9	17 0	12 0	6 2	0 0	6 2	12 0	17 0	20 9	23 2	24	

RULE.—To find the Height of the Tide above the zero of the tables at any intermediate Hour between *High and Low Water*.*

The zero of the tables is the mean height of the low water of ordinary spring tides.

From the height in the tables, subtract the half mean spring range, the remainder will be the height above the half-tide or mean level of the sea, with which enter Table (B.), and, under the time from high water, take out the corresponding correction, and, as directed, add it to,

* The mean interval of time between two consecutive high waters is about 12h. 25m., but for the mariner's purpose the duration of flood or ebb may be considered as 6 hours. There are occasional exceptions ; at Portsmouth, for example, the flood runs 7 hours and the ebb 5 hours.

or subtract it from, the half mean spring range; the result will be the height of the tide at that time above zero or the low-water standard of the tables.

EXAMPLE I.

Required the height of the tide above zero at Liverpool on March 6th, A.M., at 2 h. after high water.

Height of high water (by the tables)	-	-	-	Ft.	in.
				19	8
Half mean spring range	-	-	-	13	0
<hr/>					
Height above the half-tide or mean level of the sea	-	=		6	8
Half mean spring range	-	-	-	13	0
By table (B) 6 ft. 8 in. gives	-	-	-	+	3 4
<hr/>					
Height of the tide above zero at 2 h. after high water	=			16	4

EXAMPLE II.

Required the height of the tide above zero, at Liverpool on March 27th, P.M., at 4 h. after high water.

Height of high water (by the tables)	-	-	-	Ft.	in.
				28	6
Half mean spring range	-	-	-	13	0
<hr/>					
Height above the half-tide or mean level of the sea	-			15	6
Half mean spring range	-	-	-	13	0
By table (B) 15 ft. 6 in. gives	-	-	-	-	7 9
<hr/>					
Height of the tide above zero at 4 h. after high water	=			5	3

In some cases, however, between 5 and 6 h. from high water, the correction from table (B) will be greater than the half mean spring range; when such is the case, the tide at that time will have fallen *below* the zero of the tables by a quantity equal to the difference between the correction from table (B) and the half mean spring range.

EXAMPLE III.

Required the level of the tide at Liverpool on March 27th, P.M. at 5½ h. after high water.

Height of high water (by the tables)	-	-	-	Ft.	in.
				28	6
Half mean spring range	-	-	-	13	0
<hr/>					
Height above the half tide or mean level of the sea	-			15	6
Half mean spring range	-	-	-	13	0
By table (B) 15 ft. 6 in. at 5½ h. from high water	-			15	0
<hr/>					
Level of the tide <i>below</i> zero	-	-	-	2	0

As stated in the advertisement, the soundings in most charts are reduced to the same zero as these tables,—viz., the mean level of the low water of ordinary spring tides,—but should the soundings on any particular chart be reduced to a standard below that zero, there will, in that case, be a greater depth of water in the channel than is given in the tables, by a quantity equal to the difference between the half mean spring range and the half spring range of the chart, or in other words, the difference between the mean level of the low water of spring tides, and the low-water standard to which the soundings on the chart are reduced: for example—The soundings on the chart of Liverpool are reduced to a zero 15 ft. below the mean level of the sea, whereas, the mean spring range for that place, as shown in the result of two years' observations

		Ft.	in.
Over the Sill of Northern West Lock Entrance	-	— 2	0
„ Southern West Lock Entrance	-	— 2	0
„ „ North Passage	-	— 5	0
„ „ South Passage	-	— 0	3
„ Canada Dock, South Passages, East	-	— 1	6
„ „ „ West	-	— 1	6
„ „ Lock	-	— 0	3
„ Huskisson Dock, East Lock	-	— 1	6
„ „ „ West „	-	— 2	0
„ Sandon Dock, West Entrance	-	— 1	6
„ Wellington Half-tide Dock, East Entrance	-	— 1	3
„ „ „ West „	-	— 1	6
„ Wellington Dock, West Passage	-	— 1	6
„ Bramley-Moore Dock, North Passage	-	— 2	0
„ „ South Passage	-	— 2	0
„ Nelson Dock, South Passage	-	— 1	6
„ Stanley Dock, West Passage	-	— 2	4
„ Collingwood Dock, West Passage	-	— 1	3
„ Salisbury Dock, West Entrances, North	-	— 1	1
„ „ „ South	-	— 1	1
„ Clarence Graving Dock Basin, N. Passage	-	— 3	3
„ „ „ S. Passage	-	— 3	6
„ Clarence Half-tide Dock, West Entrance	-	— 2	6
„ „ Dock, West Passage	-	— 4	10
„ Trafalgar Lock, North and South Passages	-	— 1	5
„ „ Dock, South Passage	-	— 3	1
„ Victoria Dock, South Passage	-	— 3	1
„ Waterloo Dock and Lock, North Passage	-	— 0	9
„ „ „ South Entrance	-	— 0	9
„ Princes Dock and Locks, North Entrance	-	— 0	9
„ „ „ South Entrance	-	— 0	9
„ Georges Dock and Passage, North Entrance	-	— 3	6
„ „ „ South Passage	-	— 3	6
„ Manchester Dock, West Entrance	-	— 8	3
„ „ Lock, West Entrance	-	— 4	0
„ Canning Dock, West Passage	-	— 1	11
„ „ Half-tide Basin, two West En- trances, each	-	— 1	9
„ Albert Dock, North Passage	-	— 1	8
„ „ East Passage	-	— 2	0
„ Salthouse Dock, North Passage	-	— 2	0
„ Wapping Basin, West Passage	-	— 2	0
„ „ North and South Passages, each	-	— 2	0
„ „ Dock, West Passage	-	— 2	0
„ „ South Passage	-	— 2	0
„ Kings Dock, South Passage	-	— 3	0
„ Queens Dock Basin, West Entrances, North	-	— 1	3
„ „ „ South	-	— 1	3
„ „ West Passage	-	— 2	0
„ „ South Passage	-	— 1	6
„ Coburg Dock, West Entrance	-	— 2	0
„ Brunswick Dock, North Passage	-	— 1	6
„ „ Half-tide Dock, East Passage	-	— 2	6
„ „ „ West Entrance	-	— 2	0
„ Toxteth Dock, West Entrance	-	— 3	0
„ Harrington Dock, West Entrance	-	— 6	10
„ Herculaneum, North Passage	-	— 0	6
„ „ South Passage	-	— 0	6
„ Garston Dock	-	— 2	0

Liverpool—continued :

Ft. in.

Over the Sill of River Craft Dock, Lock, and Eagle Basin, } Outer Gates	—	8	3
„ „ „ „ „ Inner „	—	9	3
„ Duke of Bridgewater's Dock, Outer Gates	—	3	6
„ „ „ „ „ Middle „	—	8	6
„ „ „ „ „ Inner „	—	2	0
„ Canada Lock and Graving Dock	—	0	3
„ Huskisson Lock and Graving Dock	—	1	6
„ Sandon Graving Docks, Nos. 1 to 5, East	—	4	6
„ „ „ „ „ No. 6, West	—	4	6
„ Canning Graving Docks, No. 1	—	9	9
„ „ „ „ „ No. 2	—	8	0
„ Queens' Graving Docks, No. 1	—	6	4
„ „ „ „ „ No. 2	—	4	6
„ Brunswick Graving Docks, No. 1	—	5	6
„ „ „ „ „ No. 2	—	5	6

Birkenhead—

Over the Sill of Morpeth Dock from Morpeth Basin	—	3	0
„ Sills of Caisson between Egerton and Morpeth } Docks	—	0	6
„ Sill of Reverse Gate	—	2	6
„ Sills of Caisson between Egerton Dock and Great } Float	—	0	6
„ „ „ „ „ East and West Floats	—	0	6
„ Lock from Low-water Basin into Great Float.			
	Outer Sill	+	4 0
	Inner Sill	+	1 0
„ Graving Dock No. 1.	—	0	6
„ „ „ „ „ 2.	—	0	6

(applied to the heights given for Liverpool.)

Dublin—

Over the Sill of North Wall Graving Dock	+	6	0
„ Old Custom House Dock	+	3	5
„ Georges Dock	+	5	5
„ Camden Lock of Grand Canal Dock	+	7	0

(applied to the heights given for Kingstown.)

Londonderry—

Over the Sill of Graving Dock	+	6	9
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TIDAL CONSTANTS

FOR

VARIOUS BRITISH, IRISH, AND EUROPEAN PORTS.

THE following table contains Tidal Constants for several places on the coasts of the United Kingdom and of Europe, which, being applied according to the sign + or — to the times or heights belonging to the standard port to which each of them is referred, will afford a ready means of determining approximately the height as well as the time of high water at each of those several places.

[NOTE.] In the tables from 1850–1858 the Constants for the height were given for such places only where the curves for the place and the standard port were similar, the Constant being the difference between the whole rise at the two places. But as that arrangement, which at times referred necessarily to a standard port on a distant part of the coast, appears to have confused the mariner, he is now referred to the standard port in the locality of the required place, which although the result deduced thereby may not be strictly accurate, yet it is sufficiently near for practical purposes.

COAST OF IRELAND	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Skull	— 0 59	— 2 1	Queenstown.
Crookhaven	— 0 52	..	"
Dunmanus Harbour	— 1 4	— 2 4	"
Dunbeacon, Dunmanus Bay	— 1 10	— 1 7	"
Black Ball Harbour	— 1 21	— 2 3	"
Castletown, Bearhaven	— 0 47	— 2 0	"
Bantry Harbour	— 1 14	— 1 7	"
West Cove, Kenmare River	— 1 9	— 1 9	"
Valentia Harbour	— 1 19	— 0 8	"
Limerick, R. Shannon	+ 1 45	+ 1 9	Galway.
Mellon	+ 1 26	..	"
Foynes Island	+ 1 0	+ 0 7	"
Tarbert	+ 0 22	— 0 7	"
Kilrush	+ 0 7	..	"
Carrigaholt	+ 0 9	..	"
Kilbaha	— 0 19	— 1 9	"
Roundstone	— 0 50	+ 1 9	Sligo.
Inishbofin	— 0 44	+ 0 4	"
Westport	— 0 21	+ 1 1	"
Achillbeg	— 0 4	— 0 6	"
Blacksod Bay (Quay)	— 0 31	..	"
Broadhaven Harbour	— 0 18	— 0 9	"
Donegal Harbour, (Salthill Quay)	+ 0 5	..	"
Killybegs	+ 0 13	..	"
Lough Rossmore	+ 0 19	..	"
Gweedore Bay (Bunbeg)	+ 0 14	— 0 6	"
Sheephaven	+ 0 7	+ 0 7	"
Rathmullan, Lough Swilly	+ 0 24	..	"
Coleraine	— 1 37	— 1 6	Londonderry.
Port Rush	— 1 53	— 2 6	"
Ballycastle Bay	— 4 18	..	Belfast.
Lough Larne	— 0 13	..	"
Donaghadee	+ 0 3	+ 0 3	Kingstown.
Lough Strangford (Killard Point)	— 0 17	..	"
" Strangford Quay	+ 1 21	..	"
" Carlingford (Bar) or Cranfield Point	— 0 10	..	"
Warrenpoint	0 0	+ 3 1	"
Howth	— 0 1	..	"
Dublin Bar	+ 0 2	..	"
Wicklow	— 0 41	..	"
Arklow	— 2 25	..	"
Wexford	+ 2 1	— 7 4	Waterford.
New Ross	+ 0 44	+ 0 1	"
Waterford Bridge	+ 0 46	+ 1 0	"
Dunmore	+ 0 7	— 0 2	"
Ballinacourty, Dungarvan	— 0 8	0 0	"
Youghal	— 0 6	+ 0 3	"
Ballycotton	— 0 26	— 0 5	"
Kinsale	— 0 18	— 0 4	Queenstown.
Courtmacsherry	— 0 25	— 1 1	"
Castletownsend	— 0 40	— 1 0	"
Baltimore	— 0 38	..	"

PORTS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
ves	— 2 10	..	Weston-super-mare.
stow	— 1 41	..	"
dy Island	— 1 39	..	"
staple Bar	— 1 24	..	"
combe	— 1 12	..	"
gewater Bar	— 0 4	..	"
ishead	+ 0 22	..	"
tol (King Road)	+ 0 2	..	"
liff	+ 0 5	..	"
nsea (Mumbles Lighthouse)	— 0 11	..	Pembroke.
elly	+ 0 4	..	"
by	— 0 12	..	"
ord Haven (entrance)	— 0 20	..	"
guard, Goodic Pier	— 3 15	— 4 5	Holyhead.
ligan	— 3 10	..	"
rystwyth	— 2 40	— 3 0	"
rdovey	— 2 11	..	"
nouth	— 2 31	..	"
heli	— 2 25	..	"
lsey Island	— 2 31	..	"
h-dyn-lleyn	— 1 41	..	"
rnarvon	— 0 38	— 2 3	"
umaris	— 0 51	— 4 7	Liverpool.
Fleetwood (Wyre Lighthouse)	— 0 12	..	"
lton-le-Sands	+ 0 3	+ 1 3	"
tehaven	— 0 9	— 2 9	"
Bees Head and Port Har- } ngton	— 0 18	..	"
rkington	— 0 19	..	"
yport	— 0 20	..	"
ey Head	— 0 13	..	"
therness	— 0 3	..	"
an Foot	+ 0 33	..	"
t Carlisle	+ 0 47	..	"
glas, Isle of Man	+ 1 1	..	Holyhead.
sey "	+ 1 1	+ 3 3	"
" "	+ 0 57	+ 0 3	"
n Point, Solway Firth	— 0 1	— 2 11	Liverpool.
t Patrick	— 0 58	..	Greenock.
h Ryan	— 0 56	..	"
lash	— 0 19	..	"
pbellton	— 0 23	..	"
"	— 0 18	— 1 0	"
rossan	— 0 23	..	"
gs	— 0 18	..	"
erary	— 0 2	..	"
t Glasgow	+ 0 10	..	"
sgow	+ 1 17	..	"
an	+ 4 41	..	"
ermory, Isle of Mull	— 2 52	..	Thurso.
tree, Isle of Skye	— 1 56	..	"
h Inver	— 1 47	..	"
e Akin	— 2 12	..	"
era, Summer Isles	— 1 51	..	"
noway, Isle of Lewis	— 1 42	..	"
e Wrath	— 0 58	..	"

PORTS OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Stromness	+ 0 32	..	Thurso.
Lerwick	+ 2 2	..	"
Wick	— 2 55	..	Leith.
Dornock Road	— 2 17	..	"
Cromarty	— 2 21	..	"
Inverness	— 1 59	..	"
Banff	— 1 49	..	"
Peterhead	— 1 43	..	"
Aberdeen	— 1 17	..	"
Stonehaven	— 1 7	..	"
Montrose	— 0 52	..	"
Arbroath	— 0 42	..	"
Tay Bar	— 0 11	..	"
Broughty Ferry	+ 0 5	..	"
Dundee	— 0 50	+ 0 2	Sunderland.
Dunbar	— 1 14	0 0	"
Berwick	— 1 4	..	"
Holy Island	— 0 52	..	"
Blyth	— 0 7	..	"
Tynemouth Bar	— 0 2	..	"
Seaham	+ 0 2	..	"
Hartlepool	+ 0 6	+ 0 8	"
Whitby	+ 0 23	..	"
Scarborough	+ 0 49	+ 1 5	"
Filey Bay	+ 0 58	..	"
Flamborough Head	— 1 59	..	Hull.
Bridlington	— 1 50	..	"
Spurn Point	— 1 3	..	"
Great Grimsby	— 0 53	— 1 8	"
Lynn and Boston Deep	— 0 29	..	"
Wells Bar	— 0 9	..	"
„ Harbour	+ 0 31	..	"
Blakeney Bar	+ 0 1	..	"
Yarmouth Road	— 2 51	..	Harwich.
Lowestoft	— 2 9	..	"
Orfordness	— 0 51	..	"
Nore	— 0 7	..	Sheerness.
Chatham	+ 0 25	..	"
Gravesend	— 0 57	..	London.
Woolwich	— 0 28	..	"
Greenwich	— 0 24	..	"
London Docks	— 0 10	+ 0 4	"
Margate	— 2 27	..	"
Ramsgate	— 2 23	— 4 1	"
Deal	+ 0 3	..	Dover.
Folkstone	— 0 5	..	"
Dungeness	— 0 27	..	"
Rye Bay	+ 0 8	..	"
Hastings	— 0 19	..	"
Beachy Head	+ 0 8	..	"
Newhaven	+ 0 39	..	"
Shoreham	+ 0 22	— 1 2	"
Littlehampton	— 0 5	..	Portsmouth.
Selsea Bill	+ 0 4	..	"
Bembridge Point	— 0 41	..	"

PLACES OF GREAT BRITAIN.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Ampton	— 1 11	..	Portsmouth.
Cowes	— 0 56	..	"
Camber	— 1 41	..	"
St. Point	— 1 55	..	"
Church	— 2 41	..	"
.	— 2 31	..	"
Old Breakwater	— 4 40	— 5 10	"
Regis	+ 0 38	..	Devonport.
W.	+ 0 38	..	"
.	+ 0 17	..	"
South	+ 0 33	..	"
South Breakwater	— 0 6	..	"
Woe	— 0 17	..	"
.	— 0 29	..	"
W.	— 0 46	..	"
W.	— 1 13	..	"
Isles (St. Mary)	— 1 16	..	"

WESTERN COAST OF EUROPE.

Bar	— 1 27	..	Brest.
.	— 2 2	..	"
(Bar)	— 1 17	..	"
.	— 1 17	..	"
.	— 0 47	..	"
der	— 0 17	..	"
re	— 0 2	..	"
ion	+ 0 50	..	"
e Cordouan	— 0 10	..	"
ux	+ 3 3	..	"
ix	— 0 27	..	"
eu	— 0 41	..	"
Noirmoutier	— 0 45	..	"
avalo	— 0 5	..	"
zaire	— 0 7	..	"
le	— 0 29	..	"
ouis	— 0 36	..	"
oncarneau	— 0 35	..	"
Sein.	— 0 26	— 1 9	"
nt (Ushant)	— 0 15	— 0 1	"

NORTHERN COAST OF EUROPE.

ach	+ 0 27	..	Brest.
.	+ 1 6	..	"
escan	+ 1 30	..	"
.	+ 2 4	..	"
lo	+ 2 18	..	"
lle	+ 2 26	..	"
Chausey	+ 2 22	..	"
(St. Helier)	+ 2 38	..	"
ey (St. Peter Port)	+ 2 50	..	"
us	+ 2 45	..	"

NORTHERN COAST OF EUROPE.	Constants.		Standard Port for Reference.
	Time.	Height.	
	H. M.	FT. IN.	
Alderney	+ 2 59	..	Brest.
Cherbourg	+ 4 2	..	"
Barfleur	+ 5 4	..	"
La Hougue	+ 4 55	..	"
Honfleur	+ 5 42	+ 4 3	"
Quillebœuf	+ 6 19	— 9 7	"
Havre	+ 6 4	..	"
Fécamp	+ 6 57	+ 4 2	"
Dieppe.	+ 7 19	..	"
Cayeux	+ 7 18	..	"
Boulogne	+ 0 13	..	Dover.
Cape Grisnez	+ 0 15	+ 2 4	"
Calais	+ 0 37	+ 0 10	"
Dunkerque.	+ 0 56	..	"
Nieuport	+ 1 6	..	"
Ostend.	+ 1 13	..	"
Flushing	+ 2 8	..	"
Antwerp	+ 5 13	..	"
Hellevoetsluis	+ 3 18	..	"
Rotterdam.	+ 4 33	..	"
Helgoland	— 0 33	— 2 10	Harwich.

SET OF THE TIDES ALONG THE SOUTH COAST OF ENGLAND.

The tides about Plymouth Sound are tolerably regular, both flood and ebb, generally running each way about six hours and ten minutes at a mean. In Hamoaze the flood stream continues to run up, on spring tides, about fifteen minutes after high water at Devonport Dock-Yard.

It is high water in Catwater rather earlier than at the Dock-Yard; but with strong winds from the southward and westward the tide flows half an hour longer in both harbours.

At the Breakwater in Plymouth Sound it is high water a few minutes earlier than at the Dock-Yard, but the stream drains in for a short time after the water has ceased to rise.

Abreast of Plymouth Sound, about 6 miles from the land, the streams are very irregular and do not turn with the tide farther out in the offing. One hour and three-quarters before high water at the Dock-Yard the stream makes to the eastward and runs about E. by S. for one hour; during the next hour it is scarcely sensible, after which it turns to the southward, gradually changing to W.S.W. till the last quarter of the ebb on the shore, when it veers from W.S.W. to W.N. During the first 3 hours flood on the shore, its direction changes from W.N.W. to N.W., when it begins to slacken, and to set about North till at the last 4½ hours flood it runs E. by S. as at first.

Four miles south-west of the Eddystone the stream begins to run E. by S. when it is high water at the Dock-Yard, and continues about two hours and three-quarters, when it slacks and shifts to the southward. At 3¼ hours ebb on the shore it sets W.S.W.; at 4 hours W. by N.; and then W.N.W. until low water. During the first 2 hours flood on the shore the stream sets N.W. by W., and loses its strength during the third hour, running N.W. and North. During the fourth hour, what little stream there is sets N.N.E. and N.E.; and then E.N.E and E. by N. till about high water, when its direction is E. by S.

From Bolt Tail to Start Point, at 4 miles off shore, the eastern stream makes at 3 hours after high water, and the western stream 3 hours after low water on the shore; the stream sets along the land, and its greatest velocity is $2\frac{3}{4}$ knots. At neaps the turn of the stream is irregular, varying from 4 to 7 hours after high and low water on the shore, the average being 5 hours. Its rate at neaps is $1\frac{1}{2}$ knots: off the Start $2\frac{1}{2}$ knots.

Off Exmouth Bar, at three quarters of a mile, south of Straight Point, at full and change, the stream turns to the eastward at 3h. 40m. and to the westward at 11h. 0m., running in the latter direction about $4\frac{3}{4}$ hours. The direction of the western stream for the first 2 hours is W.S.W.; for the next 2 hours west, and then turns gradually to the northward. The direction of the eastern stream for the first quarter is E.N.E.; at half-tide, E. by N.; and the greatest velocity of both streams is about 1 knot.

Three miles south of Beer Head, the stream turns to the westward at 10h. 30m., and runs in that direction 4 hours, then gradually turns to the northward and runs for 2 hours between W.N.W. and N.E. by N. It may be said to turn to the eastward about 5 o'clock, and for $2\frac{1}{2}$ hours, or until half tide, sets from N.E. to E. by N., and for the next 3 hours gradually turns to the southward. The direction of the tide in this position is, therefore, round the compass, with little or no velocity, as even at springs it scarcely runs a knot, and that only for a very short period.

In West Bay, at 2 miles N.N.W. of the Bill of Portland, at full and change, the tide begins to turn at 6h. 35m. and sets as follows: 1st hour of the ebb by the shore, at Portland Breakwater, S. $\frac{1}{2}$ E., $1\frac{3}{4}$ knots. 2d hour, S. $\frac{1}{2}$ W., $1\frac{3}{4}$ knots. 3d hour, S. by W. $\frac{1}{2}$ W., $1\frac{1}{2}$ knots. 4th hour, S.W. by S., three quarters of a knot. 5th hour, N.W. $\frac{3}{4}$ N., nil. 6th hour, from N.N.W. to N. $\frac{1}{2}$ W., three quarters of a knot. 7th hour N.N.E. to E. by N., 1 knot. 8th hour, S.E. $\frac{1}{4}$ E., $1\frac{1}{4}$ knots. 1st hour of the flood, S.E. by S., $1\frac{1}{2}$ knots. 2d, 3d, 4th, and 5th hours, S.S.E., 2 knots.

At $2\frac{1}{4}$ miles S.E. $\frac{1}{2}$ S. of the Bill of Portland, near the west end of the Shambles, the 1st hour of the flood by the shore sets west, at the rate of $1\frac{1}{4}$ to half a knot. 2d hour, E. $\frac{1}{2}$ N., half a knot. 3d hour, E. by N., $2\frac{3}{4}$ knots. 4th hour, E.N.E. $\frac{3}{4}$ E., $3\frac{3}{4}$ knots. 5th hour, east, $3\frac{3}{4}$ knots. At the 1st hour of the ebb, E. by S., $3\frac{1}{2}$ knots. 2d hour, E. by S. to S.E. by S., $2\frac{1}{2}$ to $1\frac{1}{2}$ knots. 3d hour, south, 1 knot. 4th hour, S.W. by S., $1\frac{1}{2}$ knots. 5th hour, W.S.W. $\frac{1}{2}$ W., $1\frac{1}{2}$ knots. 6th hour, W. by S., 2 knots. 7th hour, W. by S., $2\frac{1}{4}$ knots. 8th hour, W.S.W. $\frac{3}{4}$ W., $1\frac{3}{4}$ knots. N.B.—About a mile south of the Bill, at half flood, by the shore, the tide sets from S.S.E. to S.E. $\frac{1}{2}$ E., and the opposite stream about W.S.W. $\frac{1}{2}$ W.: the velocity of both streams, at springs, is from 5 to 6 knots; but although the tide runs with such violence near the Race, about a mile S.W. of the Bill the tide was found very weak.

At 5 miles E.S.E. of the Bill of Portland, near the east end of the Shambles, the 1st hour of the flood by the shore sets west, $1\frac{1}{2}$ knots. 2d hour, from West to N. by E., very weak. 3d hour about E.N.E., very weak. 4th hour, E. by N., 2 knots. 5th hour, E. by N., $2\frac{3}{4}$ knots. The 1st hour of the ebb sets E.N.E., $3\frac{1}{2}$ knots. 2d hour, E.N.E., $3\frac{1}{4}$ knots. 3d hour, east, $2\frac{3}{4}$ knots. 4th hour, east and E. by N., $1\frac{1}{4}$ knots. 5th, east, N. by W., and W. by N., very weak. 6th, 7th, and 8th, about west, from $2\frac{3}{4}$ to $2\frac{1}{4}$ knots.

In Portland and Weymouth Roads there is very little tide, so that the stream is scarcely sensible, and continues to be very moderate along the shore from Weymouth to St. Albans Head.

S.S.W. $\frac{1}{2}$ W., $1\frac{1}{4}$ miles from St. Albans Head, the western stream, at full and change, makes at 10h. 45m., and the eastern stream at 4h. 45m.: the flood and ebb are of equal duration, the former setting S.E., and the latter from W.N.W. to N.W. by W.; their greatest velocity being at half tide from $4\frac{1}{2}$ to $4\frac{3}{4}$ knots.

At 1 mile S.E. of Durlstone Head, at full and change, the western stream makes at 10h. 25m., and the eastern stream at 4h. 25m., the former setting W.S.W., and the latter E.N.E.; their greatest velocity being about 3 knots: the indraught of the flood stream in thick weather might prove fatal to a ship not on her guard.

At a third of a mile E.S.E. of Peverel Point, at full and change, the western stream makes at 8h. 40m., and the eastern stream at 4h. 0m., the former setting S.W. and the latter N.E.; on the ebb there is a dangerous race over the Ledge, which extends about a mile off the Point. The velocity of the ebb stream is about 3 knots, and that of the flood about $1\frac{1}{2}$ knots. Off Old Harry at three quarters of a mile N.E. by E. of Standfast Point, at full and change, the western stream makes at 9h. 45m., and the flood or eastern stream at 4h. 10m., the flood setting from N.E. by E. to N. by E. at the rate of 1 knot, and the ebb from S. by W. to S.W. 2 knots.

At the Needles, at full and change, the western stream makes at 10h. 0m., and the flood or eastern stream at 3h. 40m., and the velocity of both streams over the Bridge and in the South Channel is from 3 to 4 knots; but between Hurst Point and the Island, $5\frac{1}{2}$ knots, and to the southward of the Bridge about 2 knots. In the Solent, the eastern or flood stream makes at 4h., and near the Bramble at 4h. 30m.*

In Freshwater Bay, about 1 mile S.W. of Brook Point, and the same distance off Atherfield Point, at full and change, the western stream makes at 10h. 25m., and runs at the rate of 1 knot, and the flood or eastern stream at 2h. 35m. from 2 to $2\frac{3}{4}$ knots; both streams take the direction of the coast. W. by S. $4\frac{1}{2}$ miles from St. Catherine Point, the western stream makes at 11h., setting N.W. $\frac{3}{4}$ W. and the flood or eastern stream at 5h., in the opposite direction S.E. $\frac{3}{4}$ E., the rate of both being from 2 to 4 knots; but at 1 mile W. by S. from the Point the streams set N.W. by N. and S.E. by S., 3 to 4 knots, and at two thirds of a mile S.S.W. of the Point, W. by N. and E. by S., with the same velocity.

Nearly 5 miles S.S.E. of Dunnose, at full and change, the stream turns at 10h. 40m. and 4h. 30m. and sets E. $\frac{1}{2}$ S. and W. by N.; velocity, from 4 to 5 knots; but S.E., 2 miles from Dunnose, the flood sets E. by N., and turns at the same time as in Portsmouth Harbour, and the ebb W. by S., but one hour earlier than it does in the harbour.

Princessa. At the N.W. buoy, at full and change, the western stream makes at 10 o'clock, and runs 6 hours W.S.W. $\frac{1}{2}$ W. The eastern stream commences at 4 o'clock, and sets very nearly in the opposite direction, E.N.E. At the S.E. buoy the tides are about half an hour later, and set as follows; viz., the western stream, first part, W. $\frac{3}{4}$ S., gradually becomes more southerly, and at the last of the tide runs S.W. by S. The course of the eastern stream is pretty nearly the same throughout the whole of the tide, E. by N.

At the Nab Light Vessel, the tidal stream is nearly rotary, which is probably caused by the Spithead tide meeting the tide round Dunnose

* In the Solent, and as far to the westward as Portland, there are what are termed the *first* and *second* high waters. This double high water is probably caused by the tidal stream at Spithead, for, as long as that stream runs strong to the westward the tide is kept up in Southampton water, and there is no fall of consequence until the stream begins to slack at Spithead, but when the stream makes to the eastward at Spithead the water falls rapidly at Southampton. After low water, the tide rises there pretty steadily for 7 hours, which may be considered as the *first* or proper high water; it then ebbs for an hour about 9 inches, at the end of which time it again commences to rise, and in about $1\frac{1}{4}$ hours reaches its former level, and sometimes higher; this is called the *second* high water. To the mariner, the knowledge that the high water at Southampton remains nearly stationary for rather more than 2 hours may, in some cases, be important. Similar *first* and *second* high waters occur on either shore of the Solent, as shown in the times of high water at full and change, page 149.

At Havre, on the French coast, the high water remains stationary for one hour, with a rise and fall of 3 or 4 inches for another hour, and only rises and falls 13 inches for the space of 3 hours; this long period of nearly slack water is very valuable to the traffic of the port, and allows from 15 to 16 vessels to enter or leave the docks same tide.

somewhere near the Light Vessel; for instance, at the 1st hour's flood by the shore it sets East; 2d and 3d hours, E.N.E.; 4th, N.E.; 5th, N.E. by N.; 6th, North; 7th, N.N.W. to N.W.; and the last drain of the flood, N.W. by W. The 1st hour's ebb sets W. by N.; 2d W. by S. to W.S.W.; 3d, S.W. by W. to S.W.; 4th, S.W. $\frac{1}{2}$ S., the first part of the 5th hour, S.S.W., gradually trending to the southward until low water by the shore, when it sets S.E. There are only a few minutes slack. At full and change, the eastern stream makes at 8h. 30m., and the western stream at 12h. 15m.

At the Warner, at full and change, the eastern stream makes at 2 o'clock, and runs $7\frac{1}{2}$ hours about S.S.E.; and the western stream at 9h. 30m., and runs nearly $4\frac{1}{2}$ hours N.N.W.

Near the Horse Elbow, the tide must be strictly attended to, for in many cases it sets directly over that shoal. The eastern stream makes at 2 o'clock, $2\frac{1}{2}$ hours after the tide on the shore, and runs to the S.E. $7\frac{1}{4}$ hours; the western stream makes at 9h. 15m., $4\frac{3}{4}$ hours after low water on the shore, and runs nearly 5 hours to the N.W.

At the Dean Elbow, at full and change, the eastern stream, which sets over that shoal, makes at 2 o'clock, runs to the S.E. for 2 hours, and then sets east for the remainder of the tide, $5\frac{1}{2}$ hours; the western stream makes at 9h. 45m., and runs W.N.W. $4\frac{1}{4}$ hours.

At Spithead, at full and change, the eastern stream makes about 2 o'clock, $2\frac{1}{2}$ hours after high water in the harbour, and runs 7 hours S.E. by S.; and the western stream about 9 o'clock, $2\frac{1}{2}$ hours before high water in the harbour, and runs 5 hours N.W. by N.

In Portsmouth Harbour the flowing continues about seven hours, and a narrow stream runs in, fifteen or twenty minutes after high water at the Dock-Yard. From the result of three years' observations taken at the Dock-Yard it appears that at high water, slack water at springs continues for eight minutes, and at neaps sixteen minutes.

Looe Stream. At the western entrance near the Pullar Buoy, at full and change, the eastern stream makes at 3h. 45m., and the western stream at 10 hours, and sets S.E. and N.W. Between 2 and 3 miles outside of the Boulder Bank, the stream turns about an hour later; the eastern stream setting E.S.E. and the western stream west. Between the Pullar Bank and the Middle Owers, the eastern stream sets E.S.E. and the western stream west. At the eastern entrance, near Eastborough Head, the eastern stream makes at 4h. 30m., and sets E.N.E. $\frac{1}{2}$ E., and the western stream at 9h. 50m. west. Off the west end of the Hooe Bank, the eastern stream makes at 4h. 35m. and sets E.S.E., and the western stream at 10h. 30m. W. $\frac{3}{4}$ N.

About 1 mile S.S.E. of the South Foreland Lighthouse, the stream begins to set to the eastward about 1h. 30m. before high water on the shore at Dover, and runs from N.E. by E. to E.N.E. about $5\frac{1}{2}$ hours, or till 4 hours after high water: it then turns and sets W.S.W. $\frac{1}{4}$ W. about 7 hours. At Dover the flowing stream very seldom continues more than 5 hours, and sometimes scarcely so much; it is nearly the same at Ramsgate. To the northward of the South Foreland the streams change their direction to N.E. $\frac{1}{2}$ N. and S.W. $\frac{1}{2}$ S.

In the Downs the north-eastern stream begins about 1h. 20m. before high water at Dover, and continues to run 5h. 30m.: it then turns and runs in a contrary direction till 2 hours before the ensuing high water.*

In the Gull Stream, 1 mile N.N.W. from the Bunthead, the northern stream begins about 1h. 10m. before high water at Dover, and continues for 6 hours: it then turns and runs in a contrary direction till $1\frac{1}{2}$ hours before the ensuing high water. Its direction is N.E. $\frac{3}{4}$ N.; but the last hour changes to E.N.E., and even to the southward of East; the last hour of the southern stream changes from S.W. $\frac{3}{4}$ S. to W.S.W., and even to the northward of West.

* For the tides at the Southsand Head and Northsand Head of the Goodwin, see Compartment VI.

TIDES ON THE EAST COAST OF SCOTLAND AND ENGLAND.

In the North Sea the flood tide-wave enters from the Atlantic Ocean between the coast of Norway and the British Isles, and passes through the various channels formed by the Shetlands, the Orkneys, and the north point of Scotland. The average rate of the stream in the offing is very moderate, not exceeding a knot and a half; but that part of the stream which enters by the Pentland Firth acquires a furious rapidity, amounting at spring tides even to eight knots. Immediately on quitting the Firth, however, it abates in strength, as it diverges into open water; its eastern branch filling up the basin of the North Sea as it advances towards the coast of Jutland and Holland; whilst its western branch, more or less confined by the Dogger and other outlying banks, swells along the shores of Scotland and England, and makes high water in all their rivers and harbours successively till it arrives in the Thames.

The following remarks will assist the seaman in tracing the movement of the tide stream along the coast :—

Off Clythness and Ord Head its rate is about 3 knots at the springs and $1\frac{1}{2}$ with the neaps, and continues to run to the southward till 11 o'clock, or till 3h. 40m. before high water at Leith. Off Covesea Point, Burgh Head, and thence westward towards Fort George and Cromarty, it runs about an hour longer.

Off Cullen the flood stream sets slowly to the eastward, increasing in velocity as it advances: off Troop Head it runs till 1 o'clock, or till 1h. 20m. before high water at Leith; off Kinnaird Head it attains the rate of 2 knots on springs, and is still accelerated as it passes Rattray Brigs till off Peterhead, which is occasioned by the junction of the direct stream from Duncansby Head. Six miles off Kinnaird Head the stream runs to the southward till 2, and at 12 miles till 3 o'clock, or till 40 minutes after high water at Leith.

Off Buchanness the stream attains its greatest strength, namely 4 knots on the springs, and $2\frac{1}{2}$ on the neaps; but off Newburgh it decreases to less than 2 knots, and ceases at 2 o'clock; and at 4 or 5 leagues in the offing it runs till 3 o'clock, or 40 minutes after high water at Leith.

The stream runs past Girdleness till 2h. 30m., or 10m. after high water at Leith; springs at the rate of $2\frac{1}{2}$, neaps $1\frac{1}{2}$ knots. It runs across the mouth of Montrose Harbour and past Red Head till 3 o'clock, or 40 minutes after high water at Leith. From Red Head it sets into St. Andrews Bay till the last quarter, which sets S. and S.S.E.; but to the westward of Red Head it sets W.S.W. past Arbroath and over the Tay Bar.

At 2 miles without the Bell Rock Lighthouse the flood continues running to the southward till 2h. 55m. after high water at Leith; but between the Bell Rock and Fifeness it changes 2 hours earlier. The first part of the latter stream sets towards May Island, the middle to the South, and the last part S.S.E. The first part of the ebb sets from E.N.E. to N.E., the middle N.N.E., and the last part more northerly.

About a mile off St. Abbs Head the flood stream runs to the south-eastward till 2h. 55m. after high water at Leith; but at $5\frac{1}{2}$ or 6 leagues in the offing it continues a quarter of an hour later. About 3 miles off Berwick it runs till 4h. 10m. after high water at Leith.

At 5 miles off North Sunderland Point, and at the same distance south-eastward of the Staples, the flood stream continues till 3h. 25m. after high water at Leith.

About 2 miles off Blyth Harbour, and 4 miles off Tynemouth, it runs to the southward till 3h. 40m. after high water at Leith; and at 4 miles off Sunderland, a quarter of an hour later.

At 3 or 4 miles off Hartlepool, and at the same distance off Whitby the flood stream runs to the southward till 4h. 10m. after high water at Leith; and at the same distance off Flamborough Head it continues to run half an hour longer.

in the Norfolk and Suffolk coasts the streams of tide run nearly parallel to the shore. Off Wells the flood runs to the eastward till 10h. 30m., or three hours after high water on the shore.

10 miles off Cromer, and the same distance off Hasborough, the flood runs along shore to the southward till 10h. 15m., or 1h. 45m. after high water at Harwich, and the ebb in a contrary direction.

2½ miles off Lowestoft the flood stream continues to run to the southward till 1h. 30m. before high water at Harwich.

Off Orfordness the flood stream continues to run till about high water at Harwich Harbour; the flood sets W.S.W., and the ebb E.N.E.

Off Margate it is high water about 11h. 40m. by the ground. Near the east buoy of Margate Sand, at the first of the flood, on the shore the stream sets S. by W., veering westward, till about half flood, or 1h. 30m., it sets west, and continues veering, till at high water it falls slack at N.N.W. The ebb stream begins at N.E., veering eastward, increasing in strength till about half ebb, or 2h. 45m., when it sets S.E. by E., still veering, and the latter part with diminished strength, till at low water it falls slack at south.

Off the River Medway the flood stream runs up in mid-channel from 10h. 15m. to twenty-five minutes after high water at Sheerness Dock-Yard; at the Nore Light Vessel, although it is high water by the ground a few minutes earlier than at the Dock-Yard, yet the stream runs up the river for half an hour after high water at the Yard.

It remains to be noticed that the direction of strong winds, as well as the varying pressure of the atmosphere, considerably affect both the direction and the heights of high water. Thus in the North Sea a strong V. gale and a low barometer raise the surface 2 or 3 feet higher, and cause the tide to flow all along the coast from the Pentland Firth to the south half an hour longer than the times and heights predicted in the tables. Easterly, S.E., and S.W. winds produce opposite effects,

and will be felt as far down the Channel as Dungeness. On the contrary, at the entrance of the Channel, at Plymouth, and as far up as the Land's End, south-westerly winds, with a low barometer, raise the surface of the water; and north-easterly winds and a high barometer always lower it. These winds affect also the locality of the meeting of the North Sea and Channel tides: during moderate breezes this takes place somewhere between the North Foreland and the north end of the Goodwin Sands, and runs southward, and between the Kentish Knock and the Galloper to the northward; but both these places of meeting are liable to be removed either south or north by strong northerly or south-westerly winds.

THE TIDES AMONG THE ORKNEYS.

BY CAPTAIN F. W. L. THOMAS, R.N.

The great rapidity of the tidal streams among the Orkneys makes correct knowledge of their periods and velocities of the utmost importance to the mariner. *General Remarks.*

During the terrific gales which usually occur four or five times in every year, all distinction between air and water is lost, the nearest objects are obscured by spray, and everything seems enveloped in a thick fog; upon the open coast the sea rises at once, and striking upon rocky shores, rises in foam for several hundred feet, and spreads over the whole country.

The sea, however, is not so heavy in the violent gales of short continuance as when an ordinary gale has been blowing for many days; the whole force of the Atlantic is then beating against the Orcadian

shores, rocks of many tons in weight are lifted from their beds, and the roar of the surge may be heard for twenty miles; the breakers rise to the height of sixty feet, and on the North Shoal, which lies 8 miles N.W. of Costa Head, the broken sea is visible even at Skail and Birsà.

Similar effects may be witnessed in any stormy region, but here they are increased by the power of the tidal stream, and when the whole mass of water is in motion, a very slight inequality at the bottom of the sea is indicated by a ripple on the surface, so that by these means I have detected shoal spots (to the eastward of North Ronaldsha) at a depth of 47 fathoms, though the difference in depth was but 20 feet. On the rocky bank of the North Shoal, which is about 4 miles in length, the ripple readily distinguished any inequality of 10 and 15 feet, at a depth of 30 fathoms, even when the stream was moving but one mile per hour. It is only in calm or very fine weather that these ripplings can be observed, but when the wind increases upon a weather tide the sea will break over every inequality of the sea bottom. These broken seas are dangerous, and during the survey of these Islands I have often been in great peril from moving the ship before sufficient time had elapsed for the sea to become quiet.

The body of the tide-wave comes from the N.W., and makes high water on the whole west coast of the Orkneys at nearly the same time; the establishment for Stromness being 9 o'clock, and that for Pierowall in Westra, is about 6 minutes later. At the north-east end of the Orkneys it is but a few minutes later than at the north-west, as the establishment for Otters Wick is 9h. 13m.; but the tide there is probably retarded by having to pass over the shoal water at the mouth of the bay.

On the south-east side of the Orkneys, in Holm Sound, the high water there being derived from the tide-wave entering by the Pentland Firth takes place about 9h. 35m.

The vulgar establishment, or time of high water, full and new moon, varies greatly; the mean of nine observations at Otters Wick gives 9h. 13m., but they vary between 8h. 58m. and 9h. 42m.

When the tide has to pass through a narrow or shallow channel, the retardation is very great; thus it is high water an hour earlier at the mouth of Eynhallow Sound than at Kirkwall, though the distance is but 11 miles; and by levelling across Sanda (about half a mile), it appeared that when it was high water at Otters Wick, the sea-level was 4 feet 8 inches above the sea level of Catasand, and that high water was 1h. 43m. later at Catasand than at Otters Wick.

The mean range of tide at springs in the North Isles of the Orkneys is 11 feet 2 inches, and at neaps 5 feet 6 inches.

Extraordinary springs may be 3 feet 4 inches above or below the mean; this result is greatly increased by the semidiurnal inequality; for in some instances the difference in the rise of two consecutive tides has been observed to amount to 2 feet 10 inches.

In the South Isles the mean range at springs is about 1 foot less than in the North, being 10 feet; at neaps 5 feet.

The passage from the westward round the North end of the Orkneys is rendered somewhat treacherous by the peculiar set of the tide; for the body of the flood stream coming from the north-west, a ship must be 6 or 7 miles to the northward of the Mull of Papa to drift clear of North Ronaldsha. The first half of the flood sets from the Mull right for North Ronaldsha (S.E. b. E. $\frac{1}{2}$ E.), and should the wind fail while the flood is running, there would be a great probability of drifting ashore.

The flood stream passes slowly the North coast of Westra (sending a weak offset between Papa and Aikerness), and joins the main

*Depth of the
Tidal Stream.*

*High water
at*

*Stromness,
Pierowall,*

Otters Wick,

Holm Sound.

*Difference of
Sea-level.*

*Mean range at
North Isles.*

*Semidiurnal
inequality.*

South Isles.

*Set of tide,
Mull of Papa.*

*from Mull of
Papa to North
Ronaldsha.*

eam off Moul Head, where a bore or *röst** is formed, which stretches several miles to sea. The tide here runs about 6 knots; between Papa and North Ronaldsha 3 knots; but near North Ronaldsha the rate again increases to 6 knots, passing over the Altars of Linnay and Seal Skerry with great violence. The flood splits on the West coast of North Ronaldsha with the Established Kirk (the southernmost) in one of a small byre; and should a vessel be drifting down on the island, she should endeavour to pass to the southward, when she will go clear of everything.

*Bore off Papa
Rate of Tide.*

Off Seal Skerry there is a bad *röst* with southerly winds, and the tide runs at six knots between that point and Dennis Head; it does not, however, touch the shore, but leaves a small eddy or counter-tide, where boats can turn up as far as the Skerry.

*Seal Skerry
Röst.
North
Ronaldsha.*

The tide sets strongly between Fair Isle and the Orkneys. For on one occasion having Dennis Head bearing S. $\frac{1}{4}$ E. distant 8 miles, the vessel having set S.E. $\frac{3}{4}$ S. for three hours, and being then high water on the shore, it shifted its direction $3\frac{3}{4}$ points; that is, it set South for the next three hours, or until it was half-ebb on the shore, its greatest rate having been 3 to 4 knots. An hour before this, the vessel's track began to take a curved form, which continued to grow sharper as the rate of tide decreased, so that without any stopping, we found ourselves drifting with the ebb stream North, and parallel to, but at the distance of 2 miles from, our former track. The ebb stream continued steadily North for four hours, running 2·8 at its strength, after which it began to curve to the eastward; the stream thus appearing to describe a long spiral, and revolving in the direction of the hands of a watch.

*Tide Streams
between Fair
Isle and the
Orkneys.*

It also appears that when it is half-flood on the shore, it is slack water in the stream; that when it is low water on the shore, the flood-stream is running strongest, but changing its direction from S.E. $\frac{3}{4}$ S. to South, and that the reverse happens during ebb tide.

*Tide and half-
tide.*

These observations will show how little dependence can be placed on a direct course among these treacherous tides; and those who have been beating about for some days against a head wind are particularly exposed to this danger. It is a common remark with the people of North Ronaldsha, that all vessels come ashore with the flood tide; and it is readily seen how this takes place, for the accident of it being either flood or ebb tide will make a difference of between 30 and 40 miles in position.

The flood stream from Runabrage sets into North Ronaldsha firth at the rate of 3 knots; from the Holms of Eyre it sets over the Baas of Eshan, and both streams passing through the firth at the rate of 4 knots, continue to run two hours after high water on the shore.

*North
Ronaldsha
Firth.*

Off the Start the first of the flood sets to the southward at 4, but changes, as the stream grows older, to S.W. There is an extremely strong *röst* off the Start with southerly winds and flood tide; it stretching for 4 miles to sea, but being heaviest near the shore.

*Start of Sanda.
Röst.*

Between Westra and Sanda the stream is scarcely sensible, but increasing in strength as it approaches Calf Sound and Lashy Sound, it rushes through those narrow passes at the rate of 6 knots; but decreasing to 2 or 3 knots in Eda Sound, where the stream falls into the Ronsa Firth. In those Sounds the stream runs $1\frac{1}{4}$ hours after it is high water on the shore.

*Calf and Lash
Sounds.*

In Spurness Sound the tide begins to the eastward half-an hour before low water on the shore, or $1\frac{3}{4}$ hours before it is low water in the bay, and turning every six hours. This stream is like a mill-race in

*Spurness
Sound.*

* (pronounced reust) a Scandinavian word, meaning a roaring, broken, tidal sea.

the narrows when passing Spur Ness, but it speedily becomes diffused in Sanda Sound, and off Kettletaft it scarcely runs 2 knots.

*Stronsa and
Westra Firths.*

In the Stronsa and Westra Firths, which form one continuous and nearly straight channel, the tide stream is very rapid, as through them and Enhallow Sound the body of the ocean tide is discharged.

North Shoal.

At the North Shoal, which is 15 miles from the entrance of the Firth, the tide sets W. by S. (towards the entrance), and at springs scarcely runs 2 miles an hour; neaps about one.

*Brough of
Birsa.*

Along the coast of West Mainland, or Pomona, the stream is only sensible off the points; but off the Brough of Birsa the flood stream sets to the northward for two hours after it is high water on the shore when its greatest rate is 2 knots.

*West coast of
Rowsa.*

From the Brough of Birsa the flood sets along shore for Costa and Sacquoy Heads, increasing in velocity as it approaches the Westra Firth. The influence of the indraught through Eynhallow Sound is scarcely felt beyond a line joining Costa Head and the Reef of Quendale.

Skea Skerries.

The flood stream runs South along the West coast of Westra, from the Noup to the point of Skea, and over the Skea Skerries. Between them and Rowsa the stream acquires great force, even 6 knots, and does not turn for two hours after high water on the shore. Its chief weight passes close round Kili Holm, and crosses for War Ness, (the South Point of Eda,) and the Greenholms.

*Kili Holm.
War Ness.*

Stronsa Firth.

At War Ness the tide stream runs 7 knots, and the röst is quite impassable during southerly gales and spring flood. At that time the Sound between the Gio Ness of Shapinsha and War Ness is in violent commotion, and when bound to Stronsa, a line of breakers may sometimes be seen roaring and foaming within half a cable's length, while vainly looking for a gap or smooth.

The main stream from War Ness, joined by the Stream from Eda Sound, sets past Rousholm Head, and clear of Auskerry to the open sea; and from the Greenholms, past Shapinsha and Deerness, where it is joined by the String, the usual name for the direct run of the stream from Eynhallow Sound by Gairsa, Eller Holm, and Deerness. Its rate between Shapinsha and Rousholm is 6 knots, and between the Mull of Deerness and Auskerry about 4 knots.

*Weatherness
and Fara Ness
Sounds.*

The tides in Weatherness and Fara Ness Sounds are peculiar; the stream turns to the eastward as soon as the tide has ceased to fall upon the shore; that is, the flood stream makes $2\frac{1}{2}$ hours before it does in Westra Firth. The stream pours through the narrows of Weatherness and Fara Ness Sounds at the rate of 4 knots, and then sets very weakly towards Calf Sound.

*Egilsha and
Shapinsha.*

A very weak stream runs south through Howan Sound during the flood, and it is also weak on the East side of Egilsha; for the body of the stream goes transversely across the channel, and leaves comparatively still water along Egilsha and the North side of Shapinsha.

Sound.

The flood stream from Costa Head and the reef of Quendale runs towards Eynhallow, and divides there, passing Burgher and the Wael Race at the rate of 7 knots; the streams unite when past the island, but do not average more than 4 knots down Eynhallow Sound.

*Wyre Sound.
Swine Holm.*

A very weak stream passes eastwards through Wyre Sound, and another South of Wyre island; but off Swine Holm, where the latter stream unites with that from the Westra Firth, the rate scarcely equals 2 knots. In the narrow channels among the group of Holms between Gairsa and Shapinsha, the flood sets southerly 6 knots.

*Between Gairsa
and Shapinsha*

*and by Work
Head.*

The main stream from Eynhallow Sound passes S. of Gairsa and thence transversely to Stromberry Head, and on through Shapinsha Sound. The tide stream is narrow in its passage between Work Head and Eller Holm, nor does the *String* expand for some distance after

The flood-stream running through Hoy Sound commences on the North Side at the Millstone Quarry, 4 miles from Hoy Mouth, and on the South from Hoy Head; the indraught is scarcely felt 5 miles outside the entrance.

In Hoy Mouth the rate of the stream is 4 knots, until it divides upon Gremsa, when the rate increases to 6 knots; one stream passing through Burwick Sound, the other between Gremsa and Stromness. The tide goes over the Skerry Ness, and from thence sets fair for the Skerries of Clestron, where it divides, one stream running up and filling the Bay of Irland, and at half flood setting as a back-tide out of Cairston Road; the other setting rather off shore at first, and then towards Houton Head. From Burwick Sound the stream sets along the shore of Hoy to Green Head, the rate being scarcely 3 knots; and Gremsa causes a large arrear of slack water in the middle of the Sound. After passing Houton Head, the flood stream becomes diffused in Scapa Flow, and is only sensible off that point; its general direction is towards Holm Sound, and at the Barrel of Butter it scarcely runs 2 knots at springs. On the West side of Holm the stream drains along shore to Halcrow Head, where it meets the stream from the Pentland Firth.

The tide stream runs with greater velocity and turbulence through the *Pentland Firth* than in any other part of the Orkneys; so that with a strong gale and a weather spring-tide the sea is in many places impassable, and after the wind has gone down, the sea continues to break with great violence for some days, indeed in a sailing ship more danger is to be apprehended from a calm than from a gale of wind. The tide wave from the Atlantic, opposed by the West coast of the Orkneys, is pressed against the shores of Caithness, where at Thurso the tide rises nearly 5 feet higher than at Stromness, though the latter is but 20 miles to the northward. This accumulated mass of water finds egress through the Pentland Firth, where the velocity of the stream near the Little Skerry was said by Captain Otter to have acquired the rate of 10 knots. At the Great and Lothar Skerries, which resist a large body of the tidal stream, the water is sensibly higher by 1 or 2 feet upon the stream side, and a small rapid is formed, of little height indeed, but of great power. Vessels that have drifted upon this rock, when covered by the tide, have been rolled over it, and sunk in deep water on the other side.

The establishments of the following places in the Pentland Firth were determined by Captain Otter:—

Establishments.

PLACES.	High Water.		Rise above the Spring L.W.				Range, or Rise between L.W. and H.W.				REMARKS.
			Spring.		Neap.		At Springs.		At Neaps.		
	h.	m.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	
Thurso, Scrabster Road -	8	28	14	10	11	0	14	10	5	6	Deduced from 4 years observations. Mean of 19 comparisons, but very irregular. Mean of 12 comparisons with Thurso.
Duncansby Ness -	10	14	10	0	8	6	10	0	4	0	
Stroma, South Side -	9	47	9	0	7	6	9	0	4	0	
Swona, East Side -	10	24	-	-	-	-	-	-	-	-	
West Side -	9	35	-	-	-	-	-	-	-	-	
Pentland Head, Great Skerry, East Side -	11	4	9	3	8	0	9	3	3	0	Mean of 33 comparisons with Thurso.
Great Skerry, West Side -	10	53	-	-	-	-	-	-	-	-	
Widewall -	9	3	-	-	-	-	-	-	-	-	Mean of 7 comparisons with Thurso.

The directions as well as the velocities of the tidal streams in the Pentland Firth vary with the hour of the tide; and in almost every case the flood takes a more southerly direction as the tide grows older, and the contrary with the ebb.

Rate.

Direction.

The flood stream comes South along the shore of Hoy, and East along the coast of Caithness; and the indraught increases in approaching the entrance. Between Turn Ness and Dunnet Head the usual springs rate is 7 knots, but as they round the South end of Swona and North end of Stroma, it rises to 9 knots, and when rushing past the Great Lothar to 10. About $1\frac{1}{2}$ hours after it is high water on the shore, the flood stream makes strong along the coast of South Walls, and curving to the northward of Swona, washes the Great Lothar, and passes to the northward of the Pentland Skerries.

At a later period of the tide, the stream from Brims Ness goes direct to the South end of Swona and to the Southward of the Pentland Skerries; so that after it is half flood in the stream (equal to high water on the shore), if a ship is a mile to the southward of Brims Ness, she will pass a mile to the southward of Swona, and the same distance to the southward of the Skerries.

Hoxa Sound.

From Cantick Head the flood stream sets past Stangar Head, and crossing Hoxa Sound divides on the Lime Kiln; one very weak stream setting to the southward along South Ronaldsha, while the other runs about 4 knots towards Water and Holm Sounds.

Holm Sound.

Through Holm Sound the rate of the stream is 6 knots where strongest, and it turns at one hour after it is high water on the shore. The rate

Water Sound.

through Water Sound is 4 knots.

Cantick Sound.

From Cantick Head a weak stream runs northwards, filling Long Hope and the bays on the east side of Hoy, and finding outlets through Gutter and Weddel Sounds; the rate at springs in the narrowest part of these Sounds is 2 knots.

*East side of
Hoy.*

*Pentland Firth;
round Swona ;*

Between Cantick Head and Swona the general direction of the stream is towards South Ronaldsha, and southward between it and Swona; but it is almost impossible to predict exactly what direction a drifting vessel would take; with Barth Head open North of Swona, the first quarter flood would send her to the northward of that island, and through the mid-channel between it and South Ronaldsha; but the half flood would probably press her too close to Barth Head, and perhaps on the Great Lothar.

from Widewall.

The first of the flood stream from Widewall sets direct on Barth Head and the Lothar, so that in light winds vessels should in all cases pass as near to the North Head of Swona as possible. As a general rule, if a ship, having left Widewall with light winds and flood tide, should drift nearer to Swona than Barth Head, she will be likely to clear the Lothar—if nearer to Barth Head, she will go too close to that rock.

*Pentland
Skerries.*

When the flood stream first makes at the north head of Swona, it first sets across the channel, but presently turns to the southward, passing clear of the Lothar, and then to the northward of the Pentland Skerries; but after half flood in the stream, equal to high water on the shore, the stream from the north end of Swona bends round to the southward of these islands, and consequently, at a certain period of the tide, sets towards them.

Between the Lothar and the Skerries the flood stream sets fair out to sea, about E.S.E., joining the main stream from Stronsa Firth.

From the South end of Swona the first flood sets right on the Great Skerry, dividing there, and running 7 knots close to the North rocks. On the South side the stream sets off (leaving a narrow eddy inside), at first towards the Little Skerry, but it gradually curves and goes clear of

Clette. A vessel, however, must be very near the Great Skerry to drift in that direction; if only half way between the Great and Little Skerries she would infallibly drive upon the rocks, where the current runs like a mill-stream. It must be observed, that the general tendency of the flood-stream is to set clear to the westward of the Skerries, and that a vessel must be very near the opening between the Great and Little Skerries before she would feel its indraught. After half tide in the stream, the set of flood from Swona goes well clear to the southward of the Pentland Skerries.

I cannot state with the same personal confidence the direction of the streams of tide on the South side of the Pentland Firth, but the experiments of Capt. Otter show that the flood stream from Dunnet Head and St. Johns Point has a tendency to pass to the northward of Stroma, so that a buoy set adrift within half a mile of Mey Bay will not float through Inner Sound, but rather drift on shore on the west side of Stroma; and from this it would appear that a vessel one mile to the northward of Dunnet Head, with strong flood, will go well clear to the northward of Swona.

Inner Sound.

The last of the flood stream is pressed down upon Duncansby Head, where it does not cease running till 4 hours ebb on the shore; for which reason, when a vessel is turning up from the southward, she should rather endeavour to enter the Firth upon the North side, when she will usually be able to get as far as Brough Ness while the flood is still running.

Duncansby Head.

There are large eddies under Stroma and Swona with the flood, and where they meet the main stream little whirlpools are produced, which credulity has exaggerated into objects of importance; on rare occasions they might be dangerous to boats.

Eddies of Swona and Stroma.

It is almost still water to the eastward of the Skerries during flood, and a large eddy is formed between the Great Lothar and Old Head, commencing at half-flood on the shore; it is called Liddel Eddy, from a farm of that name in South Ronaldsha.

Eddies of Pentland Skerries; and Liddel Eddy.

Wherever the tide stream is rapid past any point there is always an eddy on the opposite side, and these eddies increase as the tide grows older, till at last only a narrow stream of the former tide is left; this may be well witnessed in Hoy Sound, where the flood stream is sometimes diminished by the encroaching ebb to 20 and 30 feet in breadth.

The indraught of the ebb stream to the Pentland Firth is felt at a considerable distance from the entrance, so that vessels leaving the Mull of Deerness in calm weather are sometimes drifted into the Pentland Firth. From Copinsha the stream runs nine hours to the southward, from half flood on the shore to low water; but its rate is slow, never exceeding 2 knots, except near Old Head, where it runs four.

Ebb stream,

There is not much danger to be apprehended from the ebb stream in the Pentland Firth when it has made strong; about 3 hours after low water on the shore, it sets fairly through between Duncansby Head and the Skerries, between Swona and Stroma, and over towards Hoy; and a vessel must be far within a line joining Duncansby Head and the North end of Stroma, to feel the indraught of the Inner Sound; for a buoy that has drifted through that Sound with the flood stream will not return with the ebb.

in the Firth.

Inner Sound.

Round Brough Ness the ebb pours with great violence, and over the tail of the Great Lothar, where several vessels have thereby been lost.

Great Lothar.

The stream from the North side of the Pentland Skerry sets upon Swona, dividing upon the South Clette; but the last part of the ebb will go to the northward, between Barth Head and Swona.

Swona.

From the North Head of Swona the first ebb goes towards Brims Ness, the last towards Switha. There is a very large eddy under Swona

Eddy.

during ebb tide, which before the tide is done almost reaches as far as Cantick Head.

*Eddy of
Stroma.*

The ebb stream sets fairly through the Firth from the North end of Stroma till it meets the stream coming from Inner Sound and incloses a large eddy; at half tide these united streams set over toward Turn Ness, where the last of the ebb tide drains, while there is comparatively still water on the South side, between Dunnet Head and St. Johns Point.

It does not appear necessary to follow the course of the ebb stream throughout the Orkneys, as in almost every case it is the reverse of the flood, nor to enter into detail of those phenomena which are common to all masses of water in motion, and which any one, by observing the directions of the channels and the apparent obstructions of the several streams, can learn from the chart.

REMARKS ON THE SET OF THE TIDAL STREAMS IN THE IRISH AND ENGLISH CHANNELS, AND IN THE NORTH SEA.—BY REAR-ADMIRAL F. W. BEECHEY, F.R.S.

*The Common
Standard for
the turn of the
Streams*

A CAREFUL investigation of the tides in the Irish Channel, the English Channel, and in the North Sea, has shown the possibility of referring the movements of the several streams to a common standard, instead of resorting to the troublesome process hitherto in use, of comparing the motion of the streams with the varying times of high water along the coast.

*is High Water
at Dover and
Liverpool.*

For the entrance of the English Channel and North Sea the time of high water at Dover may be considered the standard; and for the whole of the Irish Channel, the time of high water on the shore at the entrance of Liverpool.

*Off mouth of
English
Channel.*

Off the mouth of the English Channel the stream, although materially influenced by the indraft and outset of the Channel, will be found running to the *northward and eastward*, while the water is *falling* at Dover; and to the *southward and westward* while it is *rising* at that port. The particular direction given to the stream in this part of the sea, by the meeting of the Channel and of the offing tides, will be shown in the following table (Compartment I.); and it is only necessary to mention here, that to the southward of the parallel of Scilly, the tides of the Channel and offing blend together with varying force and direction, and occasion the stream to be constantly changing, and in some places even to make the entire circuit of the compass in one tide, without ever remaining long upon any one point. So that any written description of their course is rendered almost impossible, and the table alone must be consulted for the direction at any particular hour. From this revolving motion of the stream, it has been asserted that a vessel can never be carried far in any one direction by the tide. Such, however, is not the case; for, although it may be true that while at anchor in a particular spot the vessel's head will turn to every point of the compass, yet directly she is loose she will be carried away upon a rhomb depending upon the state of the tide at Dover.

South of Scilly.

Bristol Channel.

From the parallel of Scilly to the Bristol Channel the stream is more regular, and while the water is *falling* at Dover, will be found setting to the *northward*: near the coast partaking of the direction of the shore, and turning sharply round Trevoze Head and Hartland Point into the Bristol

Channel; and while the water is *rising* at Dover, setting as sharply out of the Bristol Channel and along the land towards Scilly.

By many observations, the Light vessel at the Seven Stones has been found to swing to the *northern* tide 7 minutes after high water at Dover; and at Trevoise Head the northern tide to make 12 minutes after Dover. And as a vessel advances up the Bristol Channel the stream turns progressively later. The tides of that estuary do not follow the same law exactly as the tides of channels which are open at both extremities. The directions of the stream in the Bristol Channel will be given hereafter; at present I wish to draw the attention of the seamen to the particular fact, that while the stream from Scilly is setting to the *northward* the stream from the Irish Channel will be found setting to the *southward*, and that these streams meet off the entrance of the Bristol Channel in about the parallel of $51^{\circ}00'$ where both turn into that channel. As a general rule, in all the space eastward of a direct line joining Scilly and the Tuskar, the stream will be found running to the eastward towards the Bristol Channel, while the water is *falling* at Dover and Liverpool, and *vice versâ*, setting to the *north-east* on the southern side of the Channel and to the *south-east* on the northern side. Such is the general set of the stream in this part of the sea, which I have given in general terms to show that to the eastward of the line above mentioned a strong indraft towards the Bristol Channel will always be experienced while the water is falling at Liverpool, and *vice versâ*. To the westward of this line the tides appear to be slack; but we are in want of further observations in all this part before any particulars can be entered into. Towards Cape Clear the northern stream from Scilly seems to join the southern and western streams from the Irish Channel, and both pass to the north-west round Cape Clear, and *vice versâ*.

Seven Stones.

Meeting of the Stream in $51^{\circ} N$.

Streams between Scilly and Tuskar.

Off S. coast of Ireland.

At the Smalls Lighthouse it is slack water 5 minutes before high water at the entrance of Liverpool; the stream sets past the rock in a S. by W. $\frac{1}{2}$ W. direction while the water is *falling* at Liverpool, and N. by E. $\frac{1}{2}$ E. while it is *rising* there, veering to N. by E. during the two last hours of the tide. The strength of the tide is sensibly felt hereabout and all the way from the Smalls to Pembroke, running upwards of $3\frac{1}{2}$ or 4 knots at the height of the springs. To the southward of the Smalls the stream sweeps round in a broad curve to the S.E., and enters the Bristol Channel while the water is *falling* at Liverpool and *vice versâ*, as before stated. The *entrance of* Liverpool is properly the standard to which the turn of the stream in these pages is referred, and wherever a reference is made to that place it must be understood as being 18 minutes *earlier* than the time of high water at St. Georges Pier, to which the tide tables are adapted.

Off the Smalls.

On the Irish side, at the Saltees Lightship, for instance, the water is slack 22 minutes before it is high water at Liverpool entrance. The stream sets W.S.W. from a quarter of an hour before high water at Liverpool entrance to $1\frac{1}{4}$ hours after, and then W.N.W. to low water. The flood or *rising tide* at Liverpool sets past the Saltees for the first 3 hours E. by S., then E.S.E. for the 2 next hours, and S.E. by E. for the last hour, when the tide slacks, as before, 22 minutes before high water at Liverpool entrance.

Off the Saltees.

From the Saltees Lightvessel to the Tuskar the stream sets along the land, but towards Carnsore Point begins to tend to the northward on the flood, and finally sets sharply round that point into the Irish Channel, and must be carefully watched by vessels in this situation.

Off Carnsore Point.

SECTION I.

THE TIDAL STREAMS OF THE IRISH CHANNEL, WITH TABLES SHOWING THEIR COURSE AND RATE WHEN AT THEIR GREATEST STRENGTH.

Streams turn with the tides of Liverpool and Morecambe Bay.

IN the Irish Channel, as before observed, experiments have shown that, notwithstanding the variety of times of high water throughout the Channel, the turn of the stream over all that part which may be called the fair navigable portion of the Channel is nearly simultaneous; that the northern and southern streams in both Channels commence and end in all parts (practically speaking) at nearly the same time; and that that time happens to correspond nearly with the time of high and low water on the shore at *the entrance* of Liverpool and of Morecambe Bay,* a spot remarkable as being the point where the opposite tides coming round the extremities of Ireland terminate. So that it is necessary only to know the times of high and low water at either of these places, to determine the hour when the stream of either *tide will commence or terminate in any part of the Channel*. For this purpose the Liverpool tide-table may be used, subtracting 18 minutes from the times there given, in consequence of the high water at St. Georges Pier being later than the point which is considered as the head of the tide, and which will be found fully explained at page 125.

Streams enter N. and S. of Ireland.

The tide from the Atlantic enters the Irish Channel by two channels; of which Carnsore Point, the S.E. point of Ireland, and St. Davids Head, the S.W. point of Wales, are the limits of the southern one; and Rathlin and the Mull of Cantyre the boundaries of the northern.

Southern streams from Tuskar to the Isle of Man.

The *central portion of the stream* of flood or *ingoing* stream, runs nearly in a line from a point midway between the Tuskar and the Bishops, to a position 16 miles due west of Holyhead; beyond which it begins to expand eastward and westward; but its main body preserves its direction straight forward towards the Calf of Man, which it passes to the eastward with increased velocity as far as Langness Point, and then at a more moderate rate on towards Maughold Head. Here it is arrested by the flood or southern stream from the North Channel coming round the Point of Ayr, and is first turned round to the eastward by it, and then goes on with it at an easy rate direct for Morecambe Bay; thus changing its direction nearly eight points.

Eastern Branch of S. stream sets into Cardigan Bay.

The *outer portions* of the stream are necessarily deflected from the course of the great body of the water by the impediments of banks on the Irish side of the Channel, and by the tortuous form of the coast on the Welsh. The eastern portion passing Linney Head, rushes with great rapidity between the Smalls, Grassholm, and Milford Haven towards the Bishops, which it passes at a rate of between 4 and 5 knots; sets sharply round those rocks in an E.N.E. direction right over the Bass Bank, and into Cardigan Bay; makes the circuit of that Bay, and sets out again towards Bardsey, at the other extremity of it; then sweeping to the N. by W. past the island and through the Sound, it gradually takes the course of the shore, round Caernarvon Bay, filling the Menai Strait as far as Bangor; but the stream still continuing outside towards the South Stack, which it rounds, setting towards the Skerries at a rate of upwards of 4 knots; and, finally, turns sharp round those rocks for

* The entrances of Liverpool and of Morecambe Bay are, as before stated, 18 minutes earlier in their times of high water, than those given for Liverpool in the tide-tables.

Liverpool and Morecambe Bay; completing in its way the high water in the Menai, and filling the Dee, the Mersey, and the Ribble.

The *western portion of the stream*, after passing the Saltees, runs nearly in the direction of the Tuskar, sets sharply round it, and then takes a N.E. $\frac{1}{2}$ N. direction, setting fairly along the coast, but over the banks skirting the shore, so that vessels tacking near the inner edge of the sands on the flood, and on the outer edge on the ebb, have been carried upon them and lost, especially upon the Arklow and Codling Banks. Abreast of the Arklow is situated that remarkable spot in the Irish Channel, where the tide scarcely either rises or falls. The stream notwithstanding sweeps past it at the rate of 4 knots at the springs, and reaches the parallel of Wicklow Head. Here it encounters an extensive projection of the Codling bank; and while the outer portion takes the circuit of the bank, the inner stream sweeps over it, occasioning an over fall and strong rippling all round the edge, by which the bank may generally be discovered. Beyond this point the streams unite and flow on towards Howth and Lambay, growing gradually weaker as they proceed, until they ultimately expend themselves in a large space of still water situated between the Isle of Man and Carlingford. There we have not been able to detect any stream; for there another remarkable phenomenon occurs—the water rising and falling without having any perceptible stream. This space of still water is marked by a bottom of blue mud. Such is the course of the flowing water of the Southern Channel.

Western Branch sets over the Irish banks.

Off Arklow, no rise or fall.

Codling Bank.

Stream ends off Carlingford. No stream there.

In the North Channel the stream enters between the Mull of Cantyre and Rathlin Island simultaneously with that passing the Tuskar into the Southern Channel, but flows in the contrary direction. It runs at the rate of 3 knots at the springs, increasing to 5 knots near the Mull, and to 4 near Tor Point on the opposite side of the channel. The eastern branch of this stream turns round the Mull towards Ailsa and the Clyde, a portion passing round Sanda up Kilbrennen Sound and Loch Fyne. The main body sweeps to the S. by E., taking nearly the general direction of the Channel, but pressing more heavily on the Wigtonshire coast; off which it has scooped out a remarkable ditch, upwards of 20 miles long by about a mile only in breadth, in which the depth is from 70 to 100 fathoms greater than that of the general level of the bottom about it. Near the Mull of Galloway the stream increases in velocity to 5 knots; the eastern portion turns sharply round the promontory towards the Solway, and splits off St. Bees Head, one portion running up the Solway, and the other towards Morecambe Bay.

Northern Stream from Rathlin to the Clyde.

The *central portion* midway between the Mull of Galloway and the Copeland Island presses on towards the northern half of the Isle of Man; and while one portion of it flows towards the Point of Ayr, the other makes for Contrary Head, and is there turned back to the N.E. at a right angle nearly to its early course. Passing Jurby Point, it re-unites with the other portion of the stream and they jointly rush with a rapidity of from 4 to 5 knots round the Point of Ayr, and directly across all the banks lying off there, and catching up the stream from the south channel off Maughold Head, they hurry on together towards that great point of union, Morecambe Bay. This bay, the grand receptacle of the streams from both Channels, is notorious for its huge banks of sand, and also remarkable for a deep channel scoured out by the stream, and known as the Lune Deep, which is the great beacon to all vessels bound to that place.

Central portion of this stream sets to Isle of Man and Morecambe Bay.

Lune Deep.

We have now only to speak of the *western limit* of the stream, which was left off Tor Point running at a rate of 4 knots off the pitch of the point. Hence it strikes directly towards the Maidens, boiling over the Highlander and Russel Rocks, and other reefs in the vicinity of that

Western branch of N. stream to Maidens and Belfast.

dangerous group ; and takes the direction of the coast again from Muck Island to Black Head, at the entrance of the Lough of Belfast, which it fills.

Belfast Lough. The portion of the stream which sets into Belfast Lough splits off Grey Point ; one portion flowing up towards Garmoyle, while the other bends back along the shore of Bangor, Groomsport, and Orlock, and blends with the general stream which has come on from the Maidens and Blackhead in nearly a straight line, and passes with it through the sounds of the Copeland Islands. Hence it proceeds along the coast, brushes the South Rock, and runs on towards St. Johns Point ; off which the stream, like that coming from the southward, expends itself in the large space of still water, which remains almost undisturbed, although pressed upon by streams from various quarters.

Ingoing Streams. Such is a general description of the streams in the Irish Channel, which are produced by the flowing of the water, or which, for the purpose of distinction, we may designate the *inging streams*.

Outgoing Streams. The ebbing or *outgoing streams* do not materially differ from the reverse of those, except that in the southern channel they press rather more over towards the Irish coast.

Limits of the above Streams. These observations do not, however, extend beyond the points where the Channels begin to open out, that is, beyond a line joining Rathlin and the Mull of Cantyre on the North, and the Saltees and Pembroke on the South. Outside of these limits, the waters diverge right and left ; that on the north joining the stream from Jura, and turning sharp round Rathlin ; that on the south, speaking now of the outgoing stream, sweeps past St. Davids Head into the Bristol Channel on one side, and on the other rounds the Tuskar, and passes on to Waterford.

TABLE SHOWING THE MAGNETIC DIRECTION AND RATE (AT SPRINGS)
OF THE TIDAL STREAMS IN THE IRISH CHANNEL.

In the following Table, the direction of the stream as it runs at the *E* middle of the tide or at its greatest strength, is given at four places upon lines connecting well known headlands, viz., at 5 miles from the shore, on each side of the channel, and at a third of the distance across the channel from each of those headlands. The names of the places will be found in the marginal columns; and in the adjacent column, a brief description of the course of the streams in the immediate vicinity of each headland. The western part of the stream will be found on the left-hand page, and the eastern half on the right-hand page.

To use the table, take the line nearest to your position, and at the distance across the Channel which answers best to your distance from the land, take out the direction of the stream from its column; or if the place of the ship falls between two divisions, take the mean of the two directions given in the columns for the direction of the stream at that time. To know when the stream will turn, look in the Tide Tables for the time of high water at Liverpool, for the day, and about 15 minutes after that time the stream will begin to *set out* in both the North and the South Channels, and will run in that direction until about 45 minutes before low water, when the general slack water begins. The slack water in the offing is usually spread over an interval of an hour—from the cessation of one stream to the beginning of the next.

In these tables { F stands for *flood* or *rising* tide at Liverpool.
 { E stands for *ebb* or *falling* tide at Liverpool.

As a rough general rule, in the fair way of the Channel a vessel will be carried 9 miles by the stream in a whole tide at springs, and at neaps about 6 miles; but near to the land on either side, or to the banks, the rate of the stream greatly increases.

The rates given in the table which follows are at spring tides; and in order to adapt them to neaps, one third may be subtracted from them.

TABLE showing the DIRECTION and RATE (at SPRINGS)

Position.	Remarks on the Tides near the Land.	Magnetic Direction				
		From	5 Miles.	$\frac{1}{2}$ over.		
On a line joining the Tuskar and St. Davids Head.	The stream curves with the land and slacks in shore $1\frac{1}{2}$ hours before the offing, and inside the Long Bank $2\frac{1}{2}$ hours before Liverpool, the stream setting over the bank N. by W. & S. W.	Tuskar -	N.E. $\frac{3}{4}$ E. S.W. $\frac{3}{4}$ W.	Rate. 3 3	N. E. by E. $\frac{1}{4}$ E. s. w. by w. $\frac{1}{4}$ w.	Rate. $2\frac{1}{2}$ $2\frac{1}{2}$ F E
On a line joining the Arklow Light Ship and Bardsey Island.	Near the Arklow bank the stream slacks half an hour before it does in the offing, and inside the Banks generally an hour and upwards before the offing.	Arklow Light Ship.	N.E. $\frac{1}{2}$ N. S.W. by S.	3·6 3·6	N.E. $\frac{1}{4}$ N. S.W. $\frac{1}{2}$ S.	$3\frac{1}{2}$ $3\frac{1}{2}$ F E
On a line joining the Kish Light Ship and Holyhead.	The stream slacks at the Kish upwards of half an hour before the offing, and then bends inwards, towards the bay, setting over the Kish bank; further in shore it turns $1\frac{1}{2}$ hours before the offing, and 2 hours close in shore.	Kish Light Ship.	N.N.E. S.S.W. $\frac{1}{4}$ W.	2·0 2	N.N.E. S.S.W. $\frac{1}{4}$ W.	$2\frac{1}{2}$ $2\frac{1}{2}$ F E

In approaching Holyhead be guarded against the tides which run very strong near the Headlands.

At 7 miles off the South Stack the stream runs $2\frac{1}{2}$ knots at springs.
At 5 miles ditto ditto 3 to $3\frac{1}{2}$ knots at springs.
At 2 miles ditto ditto 5 knots at springs.

The neaps run about two thirds of these rates. In the channel the direction of the flood is about N.E. by N., and near the Stack N.E. or N.E. $\frac{1}{2}$ E. towards the Skerries. Off the Skerries, that is, outside them, the flood turns more easterly, or runs E.N.E., and to the northward of the Skerries due east, or E. $\frac{1}{2}$ N.

Off the South Stack there is a race occasioned by the meeting of the tides, but increased by some uneven rocky ground off the Stack. It begins about the

Position.	Remarks on the Tides near the Land.	Magnetic Direction				
		From	5 Miles.	$\frac{1}{2}$ over.		
On a line joining the Calf of Man and the Skerries.	The flood stream meets the northern stream close to the Calf, and both run along the land to the eastward.	Calf of Man.	E. $\frac{3}{4}$ S. W.N.W. $\frac{1}{2}$ W.	Rate. $2\frac{1}{2}$ $2\frac{1}{2}$	E. $\frac{1}{4}$ N. W. $\frac{1}{4}$ S.	Rate. $1\frac{1}{2}$ $1\frac{1}{2}$ F E
On a line joining Rockabill and the Calf of Man.	From Rockabill to the northward the stream sets fair, taking nearly the direction of the coast, and passes on to St. Johns Point, when it encounters the stream from the North Channel; near here the stream turns to the westward, and bends in taking the curve of Dundrum Bay, which must be guarded against.	Rockabill -	N. by E. S. by W.	1·0 $1\frac{1}{4}$	N.E. $\frac{1}{4}$ E. S.S.W.	$\frac{1}{2}$ $\frac{1}{2}$ F E

the Stream.				Remarks on the Tides near the Land.	Position.	
$\frac{1}{2}$ over.		5 Miles.		From		
N.E. $\frac{1}{2}$	Rate. 2 $\frac{1}{2}$	N.E. $\frac{3}{4}$ E.	Rate. 3 $\frac{1}{2}$ to 4	St. Davids Head.	The stream curves with the land, and the flood sets sharply into Cardigan Bay, sweeping more	On a line joining St. Davids Head and the Tuskar.
S.W. $\frac{1}{2}$ W.	2 $\frac{1}{2}$	S.W. $\frac{3}{4}$ W.	4			
and more in as you near the land. There is consequently an in-draught into this bay on both ebb and flood.						
N.E. by N.	3 $\frac{1}{4}$	N.N.E. $\frac{1}{4}$ E.	3	Bardsey Island.	The stream curves sharply round Bardsey, and slacks 1h. 20m. in the Bardsey	On a line joining Bardsey Island and the Arklow Light Ship.
S.W. $\frac{3}{4}$ S.	3	S.S.W. $\frac{1}{4}$ W.	2 $\frac{1}{2}$			
Sound before it does in the offing; the flood setting strong into Caernarvon, and the ebb strong into Cardigan Bay, and <i>vice versâ</i> .						
N.N.E. $\frac{3}{4}$ E.	2 $\frac{1}{2}$	N. by E. $\frac{1}{4}$ E.	3 $\frac{1}{4}$	Holyhead -	In passing Caernarvon Bay the stream curves with the bay more and	On a line joining Holyhead and Kish Light Ship.
S.W.	2 $\frac{1}{2}$	S.W. $\frac{1}{4}$ S.	3			
more as you near the bight, setting into the bay on one side and out at the other end, near Holyhead Bay; the stream sets directly for the Skerries, sweeping into Holyhead Bay when inside a line, joining the North Stack and Skerries, and in the centre of the bay splits, one part setting sharply over the Platters and round Carmel Head, the other running for the Fenwick Rock and Penryn.						

First quarter ebb and flood, at first close in with the shore, and gradually increases in strength, extending to seaward in a direction between N. W. and W. S. W. from the lighthouse, according to time of tide ; about the last quarter tide it begins to subside. With strong winds blowing against the tide, the race is heavy, especially about half tide, and even dangerous at that time to small deep laden vessels, so that they should either go outside altogether or pass between it and the Stack (close to the latter). North and N. W. winds occasion the heaviest seas ; at a distance of 2 miles from the Stack the race is no longer felt, and by keeping the Skerries to the eastward of N. E. by E. $\frac{1}{2}$ E. a vessel will pass outside of it. Off the North Stack also there is a race after half tide, and although not dangerous at any time, it had better be kept clear of in heavy weather, as the seas break short.

of the Stream.					Remarks on the Tides near the Land.	Position.	
	$\frac{1}{2}$ over.		5 Miles.	From			
F E	East W. by S.	Rate. 2 1 $\frac{1}{2}$	E. $\frac{1}{2}$ N. W. $\frac{3}{4}$ S.	Rate. 3 3	Skerry Lighthouse.	From the Skerries the stream sweeps over the Coal Rock, and runs on	On a line joining the Skerries and the Calf of Man.
thence to Lynus and Liverpool in nearly a direct line; but at 10 miles off shore it takes a more northerly direction, and strikes off for the Ribble and Morecambe Bay; near Lynus it curves to the southward, and runs for Priestholm and Great Orme Head; at half tide the stream slacks in Red Bay, and turns to the northward, and off Lynus meets the true tide, and forms a race.							
F E	E. $\frac{3}{4}$ N. W. by S.	1 $\frac{1}{2}$ 1 $\frac{1}{2}$	S.E. by E. N.N.W. $\frac{1}{2}$ W.	2 1 $\frac{1}{2}$	Calf of Man	Near the Calf, and to the northward, the flood sets to the southward, and the	On a line joining the Calf of Man and Rockabill.
ebb to the northward; between the Calf and Rockabill the stream is very slack, being scarcely perceptible midway.							

TABLE showing the DIRECTION and RATE (at SPRINGS)

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.		$\frac{1}{2}$ over.		
On a line joining Calf of Man and Walney Island.	Near the Calf, and eastward to Langness Point, the stream runs strong, and near the land bends to the northward, and passes Douglass Head on to Manghold Head, where it is turned to the East and S.E. by the northern stream.	Calf of Man	E. $\frac{1}{4}$ N. W. $\frac{1}{2}$ N.	Rate. 3 $\frac{1}{4}$ 3 $\frac{1}{4}$		East West	Rate. 2 2 F E
On a line joining St. Johns Point and Peel (Isle of Man).	The streams from the north and south channels meet off St. Johns Point. Near the land the stream runs 2 knots at springs, but at a distance there is scarcely any tide. Off the mouth of Lough Strangford, on a south bearing, the outset will be felt at a distance of 3 $\frac{1}{4}$ miles, sweeping in a curve to the N.E. with the ebb, and to the S.W. with the first of the flood, forming a race: the outset continues to run 2 hours after low water.	St. Johns Point.	s.w. by w. $\frac{1}{4}$ w. N.E. by E.	1 $\frac{1}{2}$ 1 $\frac{1}{2}$		S.W. $\frac{1}{4}$ W. N.E. $\frac{1}{4}$ N.	0 $\frac{1}{2}$ Drain F E
On a line joining Peel and Mull of Galloway.	- - -	Peel -	E. $\frac{1}{4}$ N. W. $\frac{1}{2}$ N.	1 1 $\frac{1}{2}$		E. by S. W.N.W. $\frac{3}{4}$ W.	1 $\frac{1}{2}$ 1 $\frac{1}{2}$ F E

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.		$\frac{1}{2}$ over.		
On a line joining the Point of Ayr and Burrow Head.	Near the Point of Ayr, in a N.N.W. direction, there is usually a race, especially on the ebb: it takes place upon a bank, which, although shallower than the parts about it, is not dangerous.	Point of Ayr	S.E. by E. $\frac{3}{4}$ E. W. by N.	Rate. 3 $\frac{1}{4}$ 3		E. $\frac{3}{4}$ S. W. by N.	Rate. 2 $\frac{1}{2}$ 3 $\frac{1}{4}$ F E
On a line joining the Point of Ayr and St. Bees Head.	- - -	Point of Ayr	S. $\frac{3}{4}$ E. N.N.W.	2 $\frac{1}{2}$ 1 $\frac{1}{2}$		S. $\frac{3}{4}$ E. N.W. by N.	2 $\frac{1}{2}$ 2 F

On the line joining Point of Ayr and St. Bees Head are situated the White-stone and King William Banks, which are very dangerous. The tide sets immediately over them, S. by E. $\frac{1}{2}$ E., at a rapid rate, and ought to be carefully guarded against.

The stream sets round the Point of Ayr into Ramsey Bay about the time of low water at Liverpool, and sweeps over the Bahama Bank, and from thence

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.		$\frac{1}{2}$ over.		
On a line joining Copeland Island and Mull of Galloway.	- - -	Copeland Island.	S. $\frac{1}{4}$ E. N. $\frac{1}{2}$ W.	Rate. 2 2		S. by E. $\frac{1}{4}$ E. N. by W. $\frac{1}{4}$ W.	Rate. 2 2 $\frac{1}{2}$ F E

Magnetic Direction and Rate of the

After High Water at Liverpool.											
1 Hour.		2 Hours.		3 Hours.		4 Hours.		5 Hours.		6 Hours.	
Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
N. $\frac{1}{2}$ E.		North		N. by W. $\frac{1}{4}$ W.		N.N.W. $\frac{3}{4}$ W.		N.W. $\frac{1}{2}$ N.		S.W. $\frac{1}{4}$ W.	

of the TIDAL STREAMS in the IRISH CHANNEL—*continued.*

of the Stream.					Remarks on the Tides near the Land.	Position.	
	$\frac{1}{2}$ over.		5 Miles.	From			
F E	S.E. by E. $\frac{1}{4}$ E. W.N.W.	Rate. 1 $\frac{1}{2}$	S.E. $\frac{1}{2}$ S. N.W. $\frac{1}{4}$ W.	Rate. 2 2	Walney Island.	The stream sets sharply round Walney Island into Morecambe Bay.	On a line join- ing Walney Island and the Calf of Man.
F E	S. $\frac{1}{4}$ E. Slack	0 $\frac{1}{2}$	S. $\frac{1}{4}$ W. N. $\frac{3}{4}$ W.	1 $\frac{1}{4}$ 1 $\frac{1}{4}$	Peel	To the N.W. of Peel the stream divides; one part runs towards the Calf,	On a line joining Peel and St. Johns' Point.
the other turns to the N.E., passes Contrary Head, so called from the set of the tides off it, and runs with an increasing rate along the land to Jurby, and thence to the Point of Ayr.							
.	E.S.E. $\frac{1}{4}$ E. N.W. by W. $\frac{3}{4}$ W.	2 $\frac{3}{4}$ 2 $\frac{1}{4}$	E.S.E. $\frac{1}{4}$ E. N.W. by W.	3 \cdot 0 3 $\frac{1}{4}$	Mull of Gal- loway.	Off the Mull of Galloway the stream attains its greatest strength, and occasions a race off the head; but there is usually a slack very close	On a line join- ing Mull of Galloway and Peel (Isle of Man).
to the shore, of which steamers who are acquainted take advantage. Between the Mull and Burrow Head the stream bends to the northward, and finally takes the curve of the bay of Luce, setting sharply into the bay round the Mull, and out round Burrow Head.							

of the Stream.				Remarks on the Tides near the Land.	Position.
	5 Miles.		From		
F E	East W.N.W. $\frac{3}{4}$ W.	Rate. 4 4	Burrow Head	- - - - -	On a line joining Burrow Head and Point of Ayr.
F E	S.E. by S. N.W. $\frac{1}{4}$ N.	1 $\frac{3}{4}$	St. Bees Head	Between King William Bank and St. Bees Head the stream is slack, but near St. Bees begins to run, one part passing up the Solway, the other going on towards Walney.	On a line joining St. Bees Head and Point of Ayr.

passes on to Maughold Head, where it meets with the tide from the southern channel. At half flood the stream at the Bahama runs towards Ramsay, and then turns to the north-west the rest of the tide.* A few miles westward of this spot, in latitude $54^{\circ} 18' N.$ and longitude $4^{\circ} W.$, the streams from the Calf of Man, and that which had passed over the Whitestone Bank, meet and thence run directly for Walney Island.

of the Stream.				Remarks on the Tides near the Land.	Position.
	5 Miles.		From		
F E	S.S.E. $\frac{1}{4}$ E. N. by W. $\frac{1}{4}$ W.	Rate. 3 3	Mull of Galloway.	- - - - -	On a line joining Mull of Galloway and Cope-land Island.

stream at the Bahama Light Vessel.

Before High Water at Liverpool.

5 Hours.		4 Hours.		3 Hours.		2 Hours.		1 Hour.	
Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
S. $\frac{1}{4}$ W.		S. $\frac{3}{4}$ W.		S.W.		N.W. $\frac{1}{4}$ W.		N. by E. $\frac{1}{4}$ E.	

* See Bahama Light Vessel.

TABLE showing the DIRECTION and RATE (at SPRINGS)

Copeland Islands and Lough of Belfast.

The main body of the stream, ebb and flood, crosses the entrance of this Lough in a curve from the Copeland Islands to Blackhead, and near the islands gains a strength of 5 knots; this curve bends more and more in until it stretches from Whitehead to Grey Point, when it divides, one part of the flood running up to Garmoyle, the other bending back and running towards Orlock, and near that place will carry a vessel upon the Briggs if not guarded against.

The first of the flood sets through the Copeland Sound and between the islands at a rapid rate, and care must be taken not to be swept into the intricate passage between the Copeland Islands. At half tide all the inshore part of the tide within 1½ miles of the coast south of the Copelands slacks, and shortly turns to the northward and runs for 3 hours, whilst the stream in the offing is still going to the southward; so that from Ballyferris Point to Foreland Point, quite close in, the stream runs 9 hours to the northward and only 3 to the southward.

Position.	Remarks on the Tides near the Land.	Magnetic Direction					
		From	5 Miles.	½ over.			
On a line joining Corsewall Point and Sanda Sound.	Near Corsewall the stream gains strength, and close in takes the curve of the land, the flood setting to the S.W. round the lighthouse, and the ebb vice versa.	Corsewall Point.	S. ½ E.	Rate. 1½	S.E. ½ S.	Rate. 1½	F
			N.N.W.	1¼	N.W. ½ N.	1½	E
On a line joining Muck Island and Corsewall Point.	Close to Muck Island the stream attains great strength, the flood turning round Blackhead into the Lough of Belfast, but at a few miles off shore it runs straight on for the Copeland Islands.	Muck Island.	S. by E. ¼ E.	1½	S. by E. ¼ E.	1½	F
			N. by W. ¼ W.	1¼	N. by W. ¼ W.	1¼	E

The tides off Muck Island run from 3½ to 4½ knots close in, and occasion a race and heavy breaking sea at the springs; and in blowing weather there are races also off both Blackhead and Whitehead, and also the Gobbins; with the *ebb-tide* there is an eddy from half tide, close in with the shore, which may be taken advantage of by steamers at all times, and by sailing-vessels with a leading wind; but it does not extend sufficiently far off for sailing-vessels to benefit by it with a working wind, as they would be in danger of getting on the rocks if they missed stays.

Position.	Remarks on the Tides near the Land.	Magnetic Direction of the Stream.					
		From	½ over.		½ over.		
On a line joining Tor Point and Mull of Cantyre.	Close off Tor Point the flood runs upwards of four knots at springs.	Tor Point	S. by E.	Rate. 4	S. by E. ½ E.	Rate. 4	F
			N. by W.	3½	N. by W. ¾ W.	3¼	E

TIDAL STREAMS in the IRISH CHANNEL—continued.

3rd quarter of the flood having turned to the northward, meets the tide the Sound off the Deputy Reef, and they jointly strike off for the south the Copeland Islands and pass over the Bushes, and thence through the between the Islands.

eddy under Mew Island at this time rushes with great speed to the until it meets the true tide, and with it forms a race which sailing-vessels avoid; upon the ebb a similar race occurs, but to the N.E. of Mew Island.

ast of the flood goes to the northward through the Sound, and splits off h end of the Copeland, and one part runs for Mew Island, throwing off s between the islands.

bout the Copeland Islands the eddies are very strong, and at night a hould be sure that she is outside the drift of the point of Mew Island.

cam.		From	Remarks on the Tides near the Land.	Position.
5 Miles.				
S.E. by W.	Rate. 2 1 3/4	Sanda Island	The tide runs fast past Sanda Island, and is variable in its direction. Off the western end of the island it splits; the outer part passing on for the Clyde, and the other going inside the island, and up Kilbrennen Sound, as mentioned below.	On a line joining Sanda Island and Corsewall Point.
1/2 E. 1/2 W.	1 1/4 1 1/2	Corsewall Point.	- - - - -	On a line joining Corsewall Point and Muck Island.

r passing Whitehead, the tide slacks considerably as you enter the Lough. the flood there is a strong eddy under Muck Island, which will be found useful to steamers and even sailing-vessels beating along this coast; with a rly wind they will do well to keep close in with the shore hereabout, as the h of the flood strikes off from Muck Island in a S.E. direction, till it meets eam which passes the eastern side of the Maidens, when it takes a channel on; the meeting of these two tides appear to have occasioned a deep ditch, h will be found from 90 to 100 fathoms water.

Remarks on the Tides near the Land.		Position.
he Mull of Cantyre the stream runs 5 knots, and occasions a heavy erous sea in bad weather; with either tide, quite close in, there is an eddy. n the Mull of Cantyre the flood takes a direction nearly for Sanda id, and divides off its western end: one part passing inside the island up Kilbrennen Sound, the other running on for the Clyde.		On a line join- ing Mull of Cantyre and Tor Point.

THE TIDES NEAR RATHLIN ISLAND.

BY RICHARD HOSKYN, STAFF COMMANDER R.N.,

Hydrographic Office, Admiralty,

(Formerly in charge of the Survey on the North-east Coast of Ireland.)

Rate of tide.

ABOUT Rathlin Island the tides are very rapid, in the Sound they run from 4 knots at neaps to $6\frac{1}{4}$ knots at springs, occasioning strong eddies along the shores, with heavy overfalls off all the headlands.

Eddy from Tor Point through the Sound.

On each side of Tor Point there is an eddy which at half tide gradually extends from the shore, at the last quarter of the Channel flood this eddy goes to the westward through Rathlin Sound, causing the ebb stream to make there $1\frac{1}{2}$ hours sooner than it does to the northward of the island; by taking advantage of these eddies a ship from the southward may carry 9 hours tide with her through Rathlin Sound.

Eddy on south shore.

To the westward of Fair Head all along the south shore of the Sound as far as Sheep Island there is an eddy with both streams, commencing at half tide. Carrickvaan Rock lies at the junction of the eddy and true streams.

Ebb stream.

During the first hour and half, the ebb stream sets round the Rue Point into Church Bay, but after high water at Liverpool, when the general stream north of the island has made to the westward, and it has attained a rate of $6\frac{1}{4}$ knots through the Sound, an eddy begins in Church Bay, setting from the Bull Point towards the Rue, and meeting the true tide about a mile to the westward of the latter, where the bottom is very irregular, a great overfall is occasioned, called Slough-na-more, which may be attended with danger to small vessels.

*Eddy in Church Bay.**Dangerous overfall.**Direction of ebb.*

The eddy from Church Bay has now forced the main stream into a more southerly course, with contracted limits it sets from Rue Point towards the Carrickvaan Rock, whence it shoots off in a N.W. direction towards the Bull Point at the west end of Rathlin, meeting there the stream from the north side of the island setting to the S.W.

Flood stream.

The flood or eastern stream does not begin in the middle of the Sound until it is low water at Liverpool, although, as before observed, the eddy along the south shore commences at half tide. There is no slack water preceding the flood stream; in the eastern part of the Sound at low water it sets south $2\frac{1}{2}$ knots, in the western part at the same moment it sets north $1\frac{3}{4}$ knots, eddying round at each station in opposite directions. The stream soon becomes general, setting fair through the Sound, and rushing out of Church Bay past the Rue with great force, including the eddy before alluded to, it sets for 10 hours across Church Bay to the eastward. During the flood stream there is an eddy to the eastward of the island, extending $2\frac{1}{2}$ miles from the shore, setting back on the island; at the junction of the eddy and true streams there are great overfalls off Altacarry Head, and again off the Rue as mentioned above.

*Eddy to eastward of Island.**Navigation of Sound.*

With a commanding breeze there is no danger in the navigation of Rathlin Sound, but in light winds great vigilance is necessary to avoid being caught in the eddies or overfalls.

Streams off Bengore Head.

Off Bengore Head, at a mile distant, the stream turns about 15 minutes after high and low water at Liverpool; springs run 3 knots, the ebb setting W.N.W. and the flood E. b. S. In the bays on each side of the heads an eddy begins when the stream in the offing has run half its course.

At the Skerry Islets the *ebb stream* sets fair through the anchorage and Sound to the westward, attaining a velocity of 3 to $3\frac{1}{2}$ knots in its passage between Ramore Head and the Carr Rocks, and creating a very troublesome sea.

Streams near the Skerry Islet.

The flood stream sets from Ramore Head towards the Carr Rocks; when the Sound is entered it sets fair through.

In Broad Sound it sets down on the Little Skerry, while the ebb inclines to the northward through the Sound.

At the anchorage under the Great Skerry there is little tide felt, on the flood it is slack water at half tide, on the ebb with the last quarter, while on the north side of the rocks the stream runs with a velocity of 3 knots.

As we proceed to the westward towards Lough Foyle the tide loses much of its strength, north of the mouth of the Bann, 3 miles off shore its average rate at springs is $1\frac{3}{4}$ knots.

To the westward.

There is an eddy tide all the way along the shore from the Skerry Islets to the mouth of the Bann, commencing at half tide, the line of its junction with the main stream being marked by a strong rippling.

Eddy.

Two miles north of Port Stewart the channel stream turns to the eastward 1 hour and 40 minutes after low water at Liverpool, or at high water on the adjoining shore, and to the westward 31 minutes after high water at Liverpool, or three quarters of an hour before low water on the adjoining shore, so that, on this part of the coast, the tide wave (with reference to its head at Liverpool) being nearly reversed, we witness (what to a person watching the rise and fall of the tide on the shore appears at first sight so anomalous) the whole of the ebb stream coming from the ocean, while the flood comes from the opposite quarter.

Off Port Stewart.

High and low water not occasioned by tidal stream,

Referring the tidal stream to the head of the tide at Liverpool, and the varying times of high water to the undulation of the tide wave, this apparent anomaly disappears.

but by tidal wave.

All this coast to the westward of Fair Head is subject to a ground swell, in fine weather the commencement of the east-going stream is made apparent by the sudden appearance of the swell, resuming again a comparative state of quiet when the west-going stream makes.

Ground swell.

SECTION II.

THE TIDAL STREAMS OF THE ENGLISH CHANNEL, WITH TABLES SHOWING THEIR COURSE AND RATE AT EVERY HOUR OF THE TIDE AT DOVER.

Streams turn with the tides of Dover.

IN the English Channel, as before stated (page 120), the time of high water *at Dover* is to be taken as the standard, so that whenever either the time of the turn or the direction of the stream is required to be known, the time of the ship is to be compared with the time of high water for the day at the standard place, and the interval sought in the table which accompanies these remarks, and in the column answering to the ship's position will be found the information required.*

Tidal Compartments.

In these tables it has been necessary to class the information under heads answering to the various compartments of the Channels, for the courses of the stream in the mixed tides are so changeable that a very different stream will be found running at a place but little removed from another in the same portion of the Channel. The seaman must therefore look in which compartment according to his latitude and longitude his ship is sailing, and in which quarter of that compartment, whether N.E., N.W., S.E., or S.W., and then enter the table for the direction of the stream.

1st Compartment.

The 1st compartment, as previously stated (page 120), comprises the approach to the English Channel *westward of a line joining Ushant and Scilly.*

2d Compartment.

The 2d compartment comprises a space eastward of the before-mentioned line from Ushant to Scilly, and as far as a *line joining the Start and the Casquets.* In this part of the Channel there is a mixed tide, partaking of the joint directions of the Channel and Offing streams.

3d Compartment.

The 3d compartment is bounded on the west by the line joining the Casquets and the Start, and on the east by a line from *Beachy Head to Dieppe*, having the Baie de la Seine on the south. As soon as a vessel passes to the eastward of the Start and Casquets she gets into the true Channel stream which sets straight up and down Channel in the fairway, and will always carry a vessel *towards Beachy Head* while the water is *rising at Dover*, and *from it* while it is *falling there.*

4th Compartment.

The 4th compartment comprises the Gulf of St. Malo, an estuary which from its magnitude and large tides exercises a powerful influence over the navigation of that part of the Channel in its immediate vicinity; and the seaman must be especially on his guard when drawing near this locality. With the *falling water* at Dover the stream sets sharply *into this Gulf* on both sides,† which the prevalence of westerly winds is said to increase, and with the *rising water* at Dover it sets *across and out of* the Gulf, the north-eastern part of the stream sweeping round the Casquets towards Alderney, and through the Russel and other Channels about Guernsey towards the race of Alderney.

5th Compartment.

The 5th compartment contains the great bight on the south side of the Channel eastward of Cape Barfleur, known as the Baie de la Seine. With the *rising water* at Dover the stream sets sharply round Cape Barfleur *into the bay*, curving more and more as the depth of the bay is gained until it finally takes the sweep of the shore. With the flood tide the western half of the bay is partly in eddy, and the tide slacks in all that part nearly an hour before high water at Dover, whilst in the eastern half of the bay it runs about half an hour longer than at Dover.

* The time at ship is to be corrected for the longitude of Dover.

† A return of the vessels wrecked on the Channel Islands shows that the greater part of them came ashore about the end of the falling water at Dover.

so that here a ship beating up Channel towards the end of a rising tide at Dover may prolong the tide in her favour by standing close over to the French Coast eastward of Havre. On approaching Boulogne, however, at the beginning of a *rising tide*, great attention should be paid to the direction in the tables, as the streams hereabout meet and are turned down upon the French Coast, so that a ship, which on the English side would at this time have a stream setting straight up Channel, here encounters one upon her beam, sweeping her down towards the Somme, and hence probably the cause of some of the many disastrous losses which have occurred in this part of the Channel.

6th Compartment.

The 6th compartment is between Beachy Head and the North Foreland, and the Somme and Dunkerque. In this space the streams from the Channel and North Sea *meet* while the water is *rising* at Dover, and *separate* while it is *falling* there. The point of union and separation is not, however, stationary, but moves from west to east both on the rising and falling water. For instance, an hour after high water at Dover the separation begins off Beachy Head; in two hours it has reached Hastings, in three hours Rye, and so it creeps on until at low water it has gained the line extending from the North Foreland to Dunkerque. At this time the offing streams on both sides have done, and it is slack water all over the North Sea and English Channel as far as the true tide extends; but the stream does not at this time cease in the intermediate tide. When the water at Dover begins to rise, the stream on either side sets *towards Dover*, and that from the North Sea consequently *goes with the intermediate* tide, which had not yet ceased running to the westward, while the other, the Channel stream, *opposes* it, and this opposition continues throughout the rising tide at Dover; the point of meeting gradually shifting its position eastward as the tide advances on the shore.* About the time when the water at Dover has done rising, the line of meeting has reached the North Foreland, and the streams are now slack over the Channels east and west, leaving the intermediate stream running alone as before to the eastward. The next hour finds the offing streams made down east and west, so that now the intermediate stream falls in with the North Sea stream and goes with it, whilst on the west it separates from the Channel stream, splitting at the same point, Beachy Head, as at first.

Such is the general description of the course and routine of the tidal streams of the English Channel and intermediate tide, a careful perusal of which will enable the reader the more readily to understand the directions and tables annexed.

* The place of *meeting* begins off Beachy Head at *five hours before* high water on the *same spot* as that of the *separation* at *one hour after* high water; the place of *four hours before* high water is nearly the same as that of the separation at *two hours after*; and so on nearly with the subsequent hours.

TABLE showing the MAGNETIC DIRECTION of the STREAM in the ENGLISH CHANNEL at every Hour of the Tide at DOVER.

COMPARTMENT I.
Westward of a Line joining Ushant and the Land's End.

Hours.	North Side of Latitude 49°00 N.						REMARKS.	South Side of 49°00 N.	
	West part.	Rate.	Near Scilly.	Rate.	Seven Stones.	Rate.		West part.	Rate.
After High Water, Dover.	1 W.N.W. ¼ W.	Greatest rate, springs, 1'50 knots.	N.N.W. ¼ W.	Greatest rate, springs, 1'50 knots.	N. ¼ W.	Greatest rate, springs, 1'60 knots.		W. ½ S.	Greatest rate, springs, 1'50 knots.
	2 N. ½ W.		N. ½ W.		N.N.E.			N. by W. ¼ W.	
	3 N.E. ¼ E.		N.N.E.		N.E. ¼ N.			E.N.E. ¼ E.	
	4 E.N.E. ¼ E.		N.N.E.		N.E. ½ E.			E.N.E. ¼ E.	
	5 E.N.E. ¼ E.		N.E. by E.		N.E. ¼ E.			N.E. by E. ¼ E.	
	6 E. ¼ S.		E. ¼ S.		E.N.E. ¼ E.			Turning.	
Before High Water, Dover.	5 S.E. by E. ½ E.	Greatest rate, springs, 1'50 knots.	-	Greatest rate, springs, 1'50 knots.	S. ¼ W.	Greatest rate, springs, 1'60 knots.		S. by E. ½ E.	Greatest rate, springs, 1'50 knots.
	4 S. ½ E.		South.		S.S.W. ¼ W.			Draining.	
	3 S.S.W. ¼ W.		S.W.		S.S.W. ½ W.			S.W. ¼ W.	
	2 S.W. by W.		S.W. by W.		S.W. ½ S.			S.W. ¼ S.	
	1 W.S.W. ¼ W.		S.W. by W.		W.S.W.			S.W. by W. ¼ W.	

COMPARTMENT II.
Between { A Line joining the Land's End and Ushant,
" " the Casquets and Start, and
" " the Casquets and Sept Iles.

Hours.	North Side of the Channel.						REMARKS.	South Side of the Channel.					
	West part.	Rate.	Centre.	Rate.	East part.	Rate.		West part.	Rate.	Centre.	Rate.	East part.	Rate.
After High Water, Dover.	1 W.N.W. ¾ W.	Greatest rate, springs, 2'00 knots.	W. ½ N.	Greatest rate, springs, 1'50 knots.	W. ½ N.	Greatest rate, springs, 2'25 knots.	{ W. ¼ S. near Hurd's Deep. }	W. ½ S.	Greatest rate, springs, 1'50 knots.	W. ¾ N.	Greatest rate, springs, 1'50 knots.	W. ½ S.	Greatest rate, springs, 2'10 knots.
	2 Turning.		N.W. by W. ¾ W.		W. ¼ N.			Slack.		West.		W. by S.	
	3 N. ¼ E.		W. ¾ N.		West.			East.		Slack.		W.S.W.	
	4 E. ½ S.		Slack.		S. ½ W.			E. by N.		E.S.E. ¼ E.		S.E. by S.	
	5 East.		E. ½ S.		S.E. ½ S.			E.N.E. ¾ E.		E. ½ S.		S.E. by E. ¼ E.	
	6 E. by S.		E. ½ S.		E.S.E. ¼ E.			E. ¼ N.		S.E. by E. ¼ E.		S.E. ½ S.	
Before High Water, Dover.	5 E.S.E. ½ E.	Greatest rate, springs, 2'00 knots.	E. by S.	Greatest rate, springs, 1'50 knots.	E. by S.	Greatest rate, springs, 2'25 knots.		E. ¼ S.	Greatest rate, springs, 1'50 knots.	E. by S.	Greatest rate, springs, 1'50 knots.	E.S.E. ½ E.	Greatest rate, springs, 2'10 knots.
	4 Slack.		E.S.E. ¾ E.		E. ¾ S.			N.E. by E. ¾ E.		Slack.		E. ¼ N.	
	3 Turning.		Slack.		E. ½ S.			Slack.		W.N.W.		North.	
	2 W. by N.		W. ¼ N.		Turning.			S.W. by W. ¼ W.		Slack.		W.N.W. ¾ W.	
	1 W. ¾ S.		W. ¼ N.		W.S.W. ¼ W.			S.W. by W.		W. by N.		N.W. ½ W.	

COMPARTMENT III.
Between { A Line joining Start and Casquets, and
" " Point Ailly and Beachy Head.

Hours.	West part.	Rate.	Centre.	Rate.	East part.	Rate.	REMARKS.	Over Hurd's Deep.	Rate.	Off Cape Barfleur.	Rate.
After High Water, Dover.	1 W. ¾ N.	Greatest rate, flood 2'30 ebb 2'40 knots.	W.N.W. ¾ W.	Greatest rate, flood 3'0 ebb 3'3 knots.	Turning.	Greatest rate, flood 3'00 ebb 2'40 knots.		W. ½ S.	Greatest rate, flood 2'15 ebb 2'40 knots.	N.W.	Greatest rate, flood 5'4 ebb 5'3 knots.
	2 W.N.W. ½ W.		N.W. by W. ¾ W.		W.N.W. ½ W.			W. ½ S.		N.W.	
	3 W. ¾ N.		N.W. by W. ¾ W.		W.N.W. ¾ W.			W. ¾ S.		N.W.	
	4 W. ¼ S.		W.N.W.		W. ¾ N.			W.S.W.		N.W.	
	5 W. ¼ S.		W.N.W.		W. by N.			W.S.W. ¼ W.		N.W.	
	6 N.N.E. ¼ E.		W.N.W. ¼ W.		W. by N.			Slack.		N.W.	
Before High Water, Dover.	5 E. ¼ S.	Greatest rate, springs - - -	E.S.E.	Greatest rate, springs - - -	E.S.E. ¼ E.	Greatest rate, springs - - -		E. ½ S.	Greatest rate, springs - - -	S.E.	Greatest rate, springs - - -
	4 E.S.E. ¼ E.		S.E. by E. ¾ E.		E.S.E. ¾ E.			E. ½ S.		S.E.	
	3 E.S.E. ¼ E.		S.E. by E. ¾ E.		E.S.E. ¼ E.			E. ¼ S.		S.E.	
	2 E.S.E. ¼ E.		S.E. by E. ¾ E.		E.S.E. ¼ E.			E. ½ N.		S.E.	
	1 E.S.E. ¼ E.		E.S.E.		E. ¾ S.			E.N.E.		S.E.	

COMPARTMENT IV.

trance of Gulf of St. Malo on a line joining Brehat Island and S.W. line of Guernsey Island.

12 miles from Brehat Island.		12 miles from Guernsey Island.		REMARKS.	Near S.W. Point, Guernsey Island.		4 miles W. by S. from Casquets.		4 miles W.N.W. of Cape La Hague.	
Course.	Rate.	Course.	Rate.		Course.	Rate.	Course.	Rate.	Course.	Rate.
N.W. by W.	Greatest rate, springs, uncertain knots.	W. ¼ N.	Greatest rate, springs, uncertain knots.	"	W. ¼ N.	Greatest rate, springs, uncertain knots.	W. ¼ S.	Greatest rate, springs, knots.	S.W. by W. ¼ W.	Greatest rate, springs, 5 to 7 knots.
S. ½ W.		S. ¼ W.			S.S.W. ¼ W.		S.W. ¼ W.		S.W. by W. ¼ W.	
S. ¾ W.		S. ¾ W.			S.S.W. ¼ W.		S.W. ¼ W.		S.W. by W. ¼ W.	
S.E. ¼ S.		S.S.E. ¾ E.			S.E. by E. ½ E.		S. by E. ¼ E.		S.W. ¼ S.	
S.E. ¼ S.		S.E. ¾ E.			S.E. by E. ½ E.		S.E. ½ E.		S.W. ¼ S.	
S.E. ½ S.		S.E. ¼ S.			S.E. by E. ½ E.		S.E. ½ E.		N.E. by E. ¾ E.	
S.E. ¼ E.		S.E. by E.			{ S.E. by E. ½ E. }		E. ¾ N.		N.E. by E. ¾ E.	
..		..			{ E. ¼ N. }		N.E. ½ N.		N.E. by E. ¾ E.	
..		..			{ S.E. by E. ½ E. }		N.E. ½ N.		N.E. by E. ¾ E.	
..		..			{ E. ½ N. }		N.E. ½ N.		N.E. ¼ N.	
N.W. by W.		N.W. ½ N.			..		N.E. by E. ¼ E.		N.E. ¼ N.	
N.W. by W.		N.W. ½ W.			N. by W. ¾ W.		N.W. ½ W.		N.E. ¼ N.	
N.W. ¾ W.		W.N.W. ¼ W.			N. by W. ¾ W.				N.E. ¼ N.	

COMPARTMENT V.

In the Baie de la Seine, south of a line joining Cape Barfleur and Cape Antifer.

Hours.	West Part.	Rate.	Centre.	Rate.	East Part.	Rate.	REMARKS.
After High Water, Dover.	1 N.N.W. ¾ W.	knots. 4:20 } flood 3:70 } ebb	N.W. by W. ¾ W.	knots. 3:20 } flood 3:20 } ebb	W. ½ N.	knots. 3:30 } flood 3:00 } ebb	
	2 N.N.W. ½ W.		N.W. by W. ¾ W.		W. ¾ S.		
	3 N.N. W.		N.W. by W. ¾ W.		W.N.W. ¾ W.		
	4 N.N.W. ¾ W.		N.W. by W. ¾ W.		W. ¼ N.		
	5 N. by W. ¾ W.		N.W. by W. ¼ W.		W. ¼ N.		
	6 Slack.		N.W. by W. ¼ W.		W. ¼ S.		
Before High Water, Dover.	5 S.S.E.	Greatest rate, springs, - } ebb	S.E. by E. ¾ E.	Greatest rate, springs, - } ebb	W. ¼ S.	Greatest rate, springs, - } ebb	
	4 S.S.E.		S.E. by E. ¾ E.		E.N.E. ¼ E.		
	3 S.S.E.		S.E. by E. ¾ E.		E.N.E. ½ E.		
	2 S.E. by S.		S.E. by E. ¾ E.		E.N.E. ½ E.		
	1 S.E. by S.		S.E. by E. ¾ E.		E.N.E. ½ E.		

COMPARTMENT VI.

Between { A line joining Beachy Head and Point Ailly, and the North Foreland and Dunkerque.

REMARKS.	West of	East of	Off Southsand Head.		Off Northsand Head.	
	Line of Separation.		Course.	Rate.	Course.	Rate.
{ The Tides separate on a line joining— Beachy Head and St. Valery Hastings and Treport Hastings and Cayeux Folkstone and Calais South Foreland and Point Gravelines . .	W. by N.	N.E. by E. ¼ E.	N.E. ¼ E.	Greatest rate, springs, 3 3 knots.	N.N.E.	
	W. ½ N.	N.E. by E. ¼ E.	N.E. ¾ E.		N.N.E.	
	W. ¼ N.	E.N.E.	N.E. by E. ½ E.		N.E. ¼ E.	
	W. by S.	E.N.E.	N.E. by E. ¾ E.		E. by S.	
	S.W. by W. ¼ W.	N.E. by E. ½ E.				
{ Ramsgate and Nieuport, passing over North Sand Head, the South Line of the Falls, and the banks off Nieuport	W. by S.	{ E. ¼ N. and Northward. }	S.W. ¼ S.		S.S.W.	
{ The Tides meet on a line joining— Beachy Head and Point Ailly Bexhill and Cayeux, both streams turning down towards the "Somme"	Tides meet.					
	E.S.E.	S.W. by W. ¼ W.	S.W.		S.S.W.	
{ The Tides meet on a line joining Rye and the Somme, passing over the Bassuielle, both tides setting to the Somme	S.S.E. ½ E.	S. by W. ¼ W.	S.W. ¾ W.		S.S.W.	
{ The Tides meet on a line joining— Dungeness and Touquet Point Do. Dover and Dunkerque nearly	S.E. by E. ¼ E.	S.W. by W.	W.S.W. ¼ W.		S.S.W.	
	E. by N.	W.S.W. ¼ W.	W. ¾ N.		S.S.W.	
	N.E. by E. ½ E.	W.S.W.	N.N.E.		S.S.W.	

SECTION III.

TIDAL STREAMS IN THE NORTH SEA.

*Streams turn
with the Tides
of Dover.*

IN the North Sea the general features of the streams correspond exactly with those of the English Channel, but the *direction* of the stream is reversed. As soon as the intermediate tide is passed, on coming from the westward, a ship enters the True Stream, which extends from the North Foreland to a line joining the Leman and Ower Light and the Texel. To the northward between the Ower and Texel a mixed tide occurs, similar to that which is experienced off the Start, occasioned by the channel stream encountering that of the Offing Stream; and beyond these limits the time of slack water varies with the advance of the tidal hour, as at the entrance of the English Channel; and with this peculiarity also, that in a very short distance there occurs a difference of three hours in the time of slack water.

*Direction of
• True Stream.*

The True Stream will always carry a vessel *towards* the North Foreland while the water is *rising at Dover*, and *from it* while it is *falling at that place*.* This stream sets nearly N.E. and S.W., except near the coasts, where it partakes of the form of the land; and at the entrance of the Thames where it is diverted from its course by the river. The annexed table will show these deviations and the exact course of the stream in the channel, which, for the convenience of reference, is also divided into compartments.

*North Sea
divided into 15
Compartments.*

The 7th compartment comprises the entrance to the Thames; viz., at the Mouse, Sunk, Kentish Knock, and Galloper Light Vessels, and 5 miles north of the North Foreland.

The 8th compartment comprises a space between the mouth of the Thames and the coast of the Netherlands south of 52° N.

The 9th compartment comprises between 52° and 53° N. and the English coast as far as 2° E. and also the Shipwash, Stanford, Saint Nicholas Gat, Cockle, Newarp, and Hasborough Light Vessels.

The 10th compartment comprises between 52° and 53° N. and from 2° to 3° E.

The 11th compartment comprises between 52° and 53° N., and from 3° to 4° E.

The 12th compartment comprises between 52° and 53° N., and from 4° E. to the coast of the Netherlands.

The 13th compartment comprises between 53° and 54° N., and from 1° to 3° E., and the Leman and Ower Light Vessel.

The 14th compartment comprises between 53° and 54° N., and from 3° to 5° E.

The 15th compartment comprises between 53° and 54° N. and westward of 1° E., and the Spurn and Dudgeon Light Vessels.

The 16th compartment comprises from 1° to 8° E. on the parallel of 54° N.

The 17th compartment comprises from 0° to 8° E. on the parallel of 55° N.

The 18th compartment comprises from 1° to 8° E. on the parallel of 56° N.

The 19th compartment comprises from 2° W. to 8° E. on the parallel of 57° N.

The 20th compartment comprises from 3° W. to 3° E. on the parallel of 58° N.

The 21st compartment comprises from 2° W. to 0° on the parallel of 59° N.

* Upon the banks lying towards the coast of Holland, between the Texel and the Schelde, where there is scarcely any rise or fall of the water, the stream continues nearly 40 minutes longer than in other parts of the channel.

TABLE showing the MAGNETIC DIRECTION of the TIDAL STREAMS in the NORTH SEA from a line joining the SPURN POINT and HELGOLAND to the NORTH FORELAND at every hour of the tide at DOVER.

COMPARTMENT VII.
Entrance to the Thames.

Hours.	Mouse Light Ship.		Sunk Light Ship.		Kentish Knock Light Ship.		5 Miles north of North Foreland.		Galloper Light Vessel.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 W. by N.	Greatest rate, springs, 2'50 knots.	Slack.	Greatest rate, springs, 3'00 knots.	N.E.	Greatest rate, springs, 2'80 knots.	N.N.W. 1/8 W.	1'80	N.E. 1/2 E.	Greatest rate, springs, 2'5 knots.
	2 Slack.		N.E. by E. 3/4 E.		N.E.		N. 1/4 E.	1'20	N.E. by E.	
	3 E. 3/4 S.		E.N.E. 3/4 E.		N.E.		N.E. 1/2 E.	1'18	N.E. by E.	
	4 E. 1/4 S.		E.N.E. 3/4 E.		N.E.		E.S.E. 3/4 E.	1'46	N.E. 3/4 E.	
	5 E. 1/4 S.		E.N.E. 3/4 E.		N.E.		E.S.E. 3/4 E.	1'60	N.E. by E.	
	6 E. 1/2 S.		E.N.E. 3/4 E.		N.E.		S.E. 1/4 E.	1'45	N.E. by E.	
Before High Water, Dover.	5 E. 3/4 S.	Greatest rate, springs, 2'50 knots.	..	Greatest rate, springs, 3'00 knots.	S.W. 1/4 S.	Greatest rate, springs, 2'80 knots.	S.S.E. 1/2 E.	1'30	S. 3/4 W.	Greatest rate, springs, 2'5 knots.
	4 Slack.		S.W. by W. 3/4 W.		S.W. 1/4 S.		S. 3/4 W.	1'36	S.W. 1/4 S.	
	3 W. 1/4 S.		S.W. by W. 3/4 W.		S.W. 1/4 S.		S.W. 1/2 S.	1'60	S.W. by W.	
	2 W. 1/4 S.		W.S.W. 3/4 W.		S.W. 1/4 S.		S.W. 1/2 W.	1'65	s.w. by w. 1/2 w.	
	1 W. 1/4 S.		W. 1/2 S.		S.W. 1/4 S.		W.S.W.	1'40	W.S.W.	

COMPARTMENT VIII.

Between the mouth of the Thames and the coast of the Netherlands south of 52° N. latitude.

Hours.	West of 2° E.		Between 2° and 3° E.		East of 3° E.		REMARKS.
	Course.	Rate.	Course.	Rate.	Course.	Rate.	
After High Water, Dover.	1 N.E. 1/4 E.	Greatest rate, springs, {flood 2'50 to 3'00 } knots. {ebb 2'50 to 3'00 }	E.N.E. 1/4 E.	Greatest rate, springs, {flood 2'50 to 3'00 } kts. {ebb 2'00 to 3'00 }	N.E. by E. 3/4 E.	Greatest rate, springs, 2'50 to 2'90 knots.	Stream from the Schelde N.W. by W. to 3° E. turning sharply to N.E. Stream from the Schelde N.W. by W. to 2'30 E. turning sharply to N.N.E. 1/2 E.
	2 N.E. 1/2 E.		E.N.E.		N.E. by E.		
	3 N.E.		N.E.		N.E. 1/2 E.		
	4 N.E. by E. 1/4 E.		N.E. 1/4 E.		N.E. 1/2 E.		
	5 N.E. 1/2 E.		N.E. 1/2 E.		N.E. 1/2 E.		
	6 N.E. 1/4 E.		N.E.		N.N.E. 1/4 E.		
Before High Water, Dover.	5 S.W. 1/4 S.	Greatest rate, springs, 2'50 knots.	S.W. by W. 3/4 W.	Greatest rate, springs, 2'50 knots.	W.S.W.	Greatest rate, springs, 2'50 to 2'90 knots.	
	4 S.W.		S.W. 1/2 W.		S.W. 3/4 W.		
	3 S.W.		S.W.		S.W. 3/4 W.		
	2 S.W.		S.W.		S.W. 1/2 W.		
	1 S.W. 1/4 S.		S.W.		S.W. 1/4 W.		

COMPARTMENT IX.

Between the latitude 52° and 53° N. and the English Coast as far as 2° E. longitude.

Hours.	REMARKS.	
After High Water, Dover.	Stream runs northward.	
1		
2		
3		
4		
5		
Before High Water, Dover.	Stream runs southward.	
1		
2		
3		
4		
5		

TIDAL STREAMS

COMPARTMENT IX.—continued.

		Shipwash Light Vessel.	Stanford Light Vessel.	St. Nicholas Gat Light Vessel.	Cockle Light Vessel.	Newarp Light Vessel.	Hasborough Light Vessel.	
Hours.		Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.
After High Water, Dover.	1	E.N.E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ N.		N.N.E.		N. by W. $\frac{1}{4}$ W.
	2	E.N.E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ N.		N.N.E.		N. by W. $\frac{1}{4}$ W.
	3	E.N.E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ N.		N.N.E.		N. by W. $\frac{1}{4}$ W.
	4	E.N.E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ N.		N.N.E.		N. by W. $\frac{1}{4}$ W.
	5	N.E. by E. $\frac{1}{4}$ E.		N.E. $\frac{1}{4}$ E.		N.N.E.		N. by W. $\frac{1}{4}$ W.
	6	N.E.		Slack		S. $\frac{1}{4}$ W. on the turn.		S. by E.
Before Low Water, Dover.	5	S.W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S. $\frac{1}{4}$ E.		S. by E. $\frac{1}{4}$ E.
	4	S.W. by W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S. $\frac{1}{4}$ E.		S. by E. $\frac{1}{4}$ E.
	3	S.W. by W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S. $\frac{1}{4}$ E.		S. by E. $\frac{1}{4}$ E.
	2	S.W. by W. $\frac{1}{4}$ W.		S.W. by S.		S. $\frac{1}{4}$ W.		S.S.E.
	1	S.W. by W. $\frac{1}{4}$ W.		S.S.W. $\frac{1}{4}$ W.		S. by W. $\frac{1}{4}$ W.		S. by E.

COMPARTMENT X.

Between the latitude 52° and 53° N. and longitude 2° to 3° E.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
After High Water, Dover.	1 N.E. $\frac{1}{2}$ N.	Greatest rate, springs, 2' 25 knots.	N.E.	Greatest rate, springs, 1' 60 knots.	N.E. $\frac{3}{4}$ N. •	Greatest rate, springs, { flood 1' 40 knots. ebb 1' 40 }.	N. by W.	Greatest rate, springs, { flood 2' 60 knots. ebb 3' 00 }.	• Turning sharply off for the Leman and Ower.
	2 N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{2}$ N.		N.E. $\frac{3}{4}$ N.		N. $\frac{1}{2}$ E.		
	3 N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ E.		N.N.E. $\frac{1}{4}$ E.		N.N.E. $\frac{1}{4}$ E.		
	4 N.E.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ E.		N. $\frac{1}{4}$ W.		
	5 N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N. $\frac{1}{2}$ W.		
	6 N.E. $\frac{3}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. by N.		N.N.E. $\frac{1}{4}$ E.		
Before High Water, Dover.	5 S.W. $\frac{1}{2}$ S.	Greatest rate, springs, 2' 25 knots.	S.W. $\frac{3}{4}$ W.	Greatest rate, springs, 1' 60 knots.	S. $\frac{1}{2}$ E.	Greatest rate, springs, { flood 1' 40 knots. ebb 1' 40 }.	S. $\frac{3}{4}$ W.	Greatest rate, springs, { flood 2' 60 knots. ebb 3' 00 }.	• Turning sharply off for the Leman and Ower.
	4 S.W.		S.W. $\frac{3}{4}$ S.		South.		S. $\frac{3}{4}$ W.		
	3 S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		S. by W. $\frac{1}{4}$ W.		S. by W.		
	2 S.W.		S.W. $\frac{1}{2}$ S.		S.S.W. $\frac{1}{4}$ W.		S.S.W.		
	1 S.W. $\frac{1}{2}$ W.		S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		S. by W. $\frac{1}{4}$ W.		

COMPARTMENT XI.

Between the latitude 52° and 53° N. and longitude 3° to 4° E.

Hours.	S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
After High Water, Dover.									
1	N.E.		Slack.		N.E. $\frac{1}{2}$ N.		N.E. $\frac{1}{2}$ N.		
2	N.E.		N.E.		N.E.		N.E. $\frac{1}{4}$ N.		
3	N.E.		N.E.		N.E.		N.E.		
4	N.E. $\frac{1}{2}$ N.		N.E.		N.E. $\frac{1}{4}$ E.		N.E.		
5	N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		
6	N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		N.E. $\frac{1}{4}$ N.		
Before High Water, Dover.									
5	S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{2}$ S.		S. by E. $\frac{1}{2}$ E.		S.S.E. $\frac{1}{4}$ E.		
4	S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ S.		S.S.W.		South.		
3	S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{2}$ W.		S.W. $\frac{1}{2}$ S.		S.W. $\frac{1}{2}$ S.		
2	S.W. $\frac{1}{2}$ S.		S.W. $\frac{3}{4}$ W.		S.W. $\frac{1}{2}$ S.		S.W. $\frac{1}{2}$ S.		
1	S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{4}$ W.		S.W. $\frac{1}{4}$ S.		S.W. $\frac{1}{2}$ S.		
		Greatest rate, springs, 2'00 knots.		Greatest rate, springs, 2'25 knots.		Greatest rate, springs, { flood 1'70 knots. ebb 2'00 }		Greatest rate, springs, { flood 1'70 knots. ebb 2'00 }	Stream settling round Texe south-westerly

COMPARTMENT XII.

Between the latitude 52° and 53° N. and from longitude 4° E. to the Coast of the Netherlands.

Hours.		REMARKS.
After High Water, Dover.	Stream runs northward.	The stream takes the direction of the land, except close to the banks, for which special instructions are necessary.
Before High Water, Dover.	Stream runs southward.	

COMPARTMENT XIII.

Between the latitude 53° and 54° N. and from longitude 1° to 3° E.

S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	N.W. Quarter.	Leman and Ower Light Vessel.		REMARKS.
						Course.	Rate.	
N.N.W. ½ W.	Greatest rate, springs, { flood 2'25 } ebb 2'25 } knots.	N. by W. ½ W.	Greatest rate, springs, { flood 2'00 } ebb 2'30 } knots.	N.N.W. ¼ W.	N. ¼ W.	N. by W. ¾ W.	Greatest rate, springs, 2'0 knots.	Near the north point of Smith's Knoll the rates are, flood 2'6, ebb 3'0 knots.
N.W. ½ N.		N. by W. ¼ W.		North.	N. ¾ W.	N. by W. ¾ W.		
N.N.W. ½ W.		N. ¼ E.		N. by E.	N. by W. ½ W.	N.N.W.		
N.N.W. ¼ W.		N. ¼ E.		N.N.E.	N.W. ½ W.	N.N.W.		
N.N.W. ¾ W.		N. ¼ E.		E.N.E.	S. by W. ¼ W.	N.N.W.		
- - -		N.N.E. ¼ E.		S.E.	S. ¼ E.	Slack.		
S.S.E. ¾ E.		S.S.E. ¾ E.		S.E. ½ S.	S. ½ E.	S.S.E.		
S.S.E. ¾ E.		S.S.E. ¾ E.		S ¾ E.	S. by E. ¼ E.	S.S.E.		
S.S.E. ½ E.		S. by E.		South.	S.S.E. ¼ E.	S.S.E.		
S. by E.		S. ¼ E.		S. ¾ W.	E.S.E. ½ E.	S.S.E.		
S.S.E. ¼ E.		S. by W.		South.	N.E. by N.	S.S.E.		

COMPARTMENT XIV.

Between the latitude 53° and 54° N. and 3° to 5° E. longitude.

S.W. Quarter.	Rate.	S.E. Quarter.	Rate.	N.E. Quarter.	Rate.	N.W. Quarter.	Rate.	REMARKS.
W.N.W. ½ W.	Greatest rate, { flood 1'20 } ebb 1'50 } knots.	W.S.W. ½ W.	Greatest rate, { flood 1'35 } ebb 3'00 } knots.	W. ¾ S.	Greatest rate, { flood 0'80 } ebb 1'00 } knots.	S.W. by W.	Greatest rate, { flood 0'90 } ebb 1'00 } knots.	In the north-eastern quarter of this compartment the Helgoland stream joins the Channel stream on the falling water at Dover, and the streams split on the rising water at Dover, and a vessel to the northward of 53'30 on the rising tide will be set down towards Helgoland.
N.N.W. ½ W.		W.S.W. ¼ W.		West.		N.W. by W. ½ W.		
N. by W. ¾ W.		W. ¾ S.		West.		N.W. ½ N.		
N. by E. ¾ E.		N.N.W.		N.N.W. ½ W.		N. by W. ½ W.		
N.E. ¼ N.		N.E. ¼ N.		N.E. ½ N.		N.E. by N.		
N.N.E. ¾ E.		N.E. by E. ¼ E.		E. ¾ N.		E. by N.		
E. ¼ S.		E.N.E. ¼ E.		E. by S.		S.E. by E.		
S.E. ½ S.		E.N.E. ¼ E.		E.S.E. ¾ E.		S.E. ½ E.		
S. by E.		S.S.W. ¼ W.		S.E. ¾ E.		South.		
S. by W. ¼ W.		S.W. by S.		S.E. ¼ S.		S.W. ¾ S.		
S.W. ½ S.		S.W. ¼ S.		S. ¾ E.		S.W. ½ S.		Splitting on Texel Island.

COMPARTMENT XV.

Between the latitude 53° and 54° N. and westward of longitude 1° E.

Hours.	Course.	Rate.	Spurn Light Vessel.		Dudgeon Light Vessel.	
			Course.	Rate.	Course.	Rate.
Before High Water, Dover.	1	Greatest rate, } flood 2'50 } } ebb 3'75 }	E.N.E.	Greatest rate, springs, 3'25 knots.	N. by W. ½ W.	Greatest rate, springs, 2'5 knots.
	2		S.W. by S.		N.N.W.	
	3		S.W. ½ S.		N.W. ¾ N.	
	4		S.W.		W. ¾ S.	
	5		S.W.		S.W. ¼ S.	
	6		S.W.		S. ¼ E.	
	5		S.W.		S. by E. ¾ E.	
	4		N.E. by E.		S.S.E.	
	3		N.E. by E. ½ E.		S.E.	
	2		E.N.E.		E. ½ S.	
	1		E.N.E.		N.E. ½ N.	
	1					

COMPARTMENT XVI.

On the parallel of 54° N.

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
Before High Water, Dover.	1	Greatest rate, 1 knot.	N.N.W. ½ W.	Greatest rate, 1 knot.	N.W. ¼ W.	Greatest rate, 1 knot.	N.W. by W. ¾ W.	Greatest rate, 1 knot.
	2		N.W. ¾ N.		N.W. by W. ¼ W.		W.N.W. ¼ W.	
	3		N.W. ¼ W.		N.W. by W. ¾ W.		W. by N.	
	4		W.N.W. ½ W.		N.W. ¾ N.		N. ¾ W.	
	5		W. ½ S.		N. by W.		N.E. ½ N.	
	6		S. by E.		E. by N.		E. by N.	
	5		S.E. ¾ S.		E.S.E. ¾ E.		E. ¾ N.	
	4		S.E. ¼ E.		E.S.E. ¾ E.		E. ½ S.	
	3		S.E. ½ E.		E.S.E. ¾ E.		E. by S.	
	2		S.E. by E. ¼ E.		E.S.E.		S.E.	
	1		E.N.E. ½ E.		S. ¼ W.		S. by E. ½ E.	
	1							

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
Before High Water, Dover.	1	Greatest rate, 1 knot.	W. by N.	Greatest rate, 1 knot.	West	Greatest rate, 1 knot.	E.N.E. ¾ E.	Greatest rate, 1 knot.
	2		W.N.W.		W.N.W.		N.E. ½ E.	
	3		W.N.W.		W.N.W.		N.W.	
	4		W. by N.		W.N.W.		W.N.W.	
	5		W.N.W.		W.N.W.		N.W. by W.	
	6		W.N.W.		W.N.W. ½ W.		W. ½ S.	
	5		S.E. by E. ½ E.		S.S.E. ½ E.		W. by S.	
	4		S.E. by E. ¼ E.		S.E. by E. ½ E.		S.S.W. ¼ W.	
	3		E.S.E. ½ E.		S.E. by E. ¼ E.		S. ¾ E.	
	2		E.S.E. ¼ E.		S.E. by E. ½ E.		S.E. by E.	
	1		E.S.E. ½ E.		S.E. by E. ¼ E.		E.N.E. ¾ E.	
	1							

About the meridian of 8° E. the influence of the Elbe and Weser causes the stream to run nearly two hours to the north-eastward on the falling tide after it has turned westward in other parts, and on the rising tide to run two hours to the westward after the stream has turned eastward in a more westerly meridian.

On the parallel of 55° N.

On the parallel of 56° N.

COMPARTMENT XVIII.—continued.

Hours.	5° E.		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 Turning.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	Slack.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	E.N.E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N.E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.
	2 W. $\frac{1}{2}$ S.		N.N.W.		N.E. by N.		N. $\frac{1}{2}$ E.	
	3 N.W. $\frac{1}{2}$ N.		N.N.W.		N. $\frac{1}{2}$ E.		N. $\frac{1}{2}$ W.	
	4 N. by W. $\frac{1}{2}$ W.		N. by W. $\frac{1}{2}$ W.		N. $\frac{1}{2}$ W.		N. by W.	
	5 N.N.E. $\frac{1}{2}$ E.		N. $\frac{1}{2}$ W.		N. $\frac{1}{2}$ W.		N. by W.	
	6 N.E. $\frac{1}{2}$ E.		N.N.E.		N. by W.		N. by W.	
Before High Water, Dover.	5 E.N.E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N.E. by E. $\frac{1}{2}$ E.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N. by W.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.	N.N.W. $\frac{1}{2}$ W.	Greatest rate at springs $\frac{1}{2}$ knot about half tide.
	4 N.E. by E. $\frac{1}{2}$ E.		E.N.E. $\frac{1}{2}$ E.		N.E. $\frac{1}{2}$ E.		N. by E.	
	3 E.N.E. $\frac{1}{2}$ E.		E. $\frac{1}{2}$ N.		E. $\frac{1}{2}$ S.		S. by W.	
	2 East.		E. $\frac{1}{2}$ S.		E. $\frac{1}{2}$ S.		S.W.S.	
	1 E. $\frac{1}{2}$ N.		E. by S.		S.E. $\frac{1}{2}$ E.		S.W. $\frac{1}{2}$ W.	

COMPARTMENT XIX.

On the parallel of 57° N.

Hours.	2° W.		1° W.		°	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S. W. by S.	Greatest rate $1\frac{1}{2}$ knots at half tide.	S. by W. $\frac{1}{2}$ W.	Greatest rate $1\frac{1}{2}$ knots at half tide.	S. by W. $\frac{1}{2}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.
	2 S. W. by S.		S.W. $\frac{1}{2}$ S.		S.S.W.	
	3 S. W. $\frac{1}{2}$ W.		S.W.		S. by W.	
	4 N. $\frac{1}{2}$ W.		W.S.W. $\frac{1}{2}$ W.		S. by W.	
	5 Slack.		Slack.		S. $\frac{1}{2}$ E.	
	6 N.N.E. $\frac{1}{2}$ E.		N. by E. $\frac{1}{2}$ E.		Slack.	
Before High Water, Dover.	5 N.E. $\frac{1}{2}$ N.	Greatest rate $1\frac{1}{2}$ knots at half tide.	N.N.E.	Greatest rate $1\frac{1}{2}$ knots at half tide.	N.N.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.
	4 N.E.		N.N.E.		N. by E.	
	3 N.E. by N.		N.N.E. $\frac{1}{2}$ E.		N. by E. $\frac{1}{2}$ E.	
	2 N.E. by N.		N.E. $\frac{1}{2}$ N.		N.N.E. $\frac{1}{2}$ E.	
	1 South.		E.N.E.		N. by E. $\frac{1}{2}$ E.	

Hours.	1° E.		2° E.		3° E.		4° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.S.W. $\frac{1}{2}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.	N. by E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	S.S.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	S.W. $\frac{1}{2}$ W.	Greatest rate $\frac{1}{2}$ knot about half tide.
	2 S.W. $\frac{1}{2}$ S.		S. $\frac{1}{2}$ E.		South.		N.W. by W. $\frac{1}{2}$ W.	
	3 S.S.W. $\frac{1}{2}$ W.		S. by E.		S. by W. $\frac{1}{2}$ W.		W.N.W.	
	4 S.W. $\frac{1}{2}$ S.		S.E. by S.		S.W. by W. $\frac{1}{2}$ W.		N. by W. $\frac{1}{2}$ W.	
	5 Slack.		E. by S.		Slack.		N. by W.	
	6 N.E. $\frac{1}{2}$ E.		E. $\frac{1}{2}$ N.		Slack.		N. by E.	
Before High Water, Dover.	5 N.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.	E. $\frac{1}{2}$ N.	Greatest rate $\frac{1}{2}$ knot about half tide.	Turning.	Greatest rate $\frac{1}{2}$ knot about half tide.	N.N.E. $\frac{1}{2}$ E.	Greatest rate $\frac{1}{2}$ knot about half tide.
	4 N. E. by E.		E. by N.		N.E. by N.		N.E. $\frac{1}{2}$ N.	
	3 E.N.E. $\frac{1}{2}$ E.		East.		N.E. $\frac{1}{2}$ E.		N.E. by E. $\frac{1}{2}$ E.	
	2 E.N.E. $\frac{1}{2}$ E.		East.		E. by N.		E.N.E.	
	1 Slack.		S. $\frac{1}{2}$ E.		S.E. by E. $\frac{1}{2}$ E.		E. $\frac{1}{2}$ S.	

COMPARTMENT XIX.—continued.

Hours.	5°		6° E.		7° E.		8° E.	
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 N. by E. ¼ E.	Greatest rate 1/3 knot about half tide.	S. by E.	Greatest rate ¼ knot about half tide.	E.N.E.	Greatest rate ¼ knot about half tide.	S.S.E.	Rate 0.9 knot.
	2 N.E. by N.		South.		E.N.E. ¼ E.		Slack.	
	3 S.W.		S. by W.		E.N.E.		N.E. by N.	
	4 N.N.W.		N.N.E.		E.N.E.		N.E. ¾ N.	
	5 N. ¾ W.		North.		E.N.E.		North.	
	6 N. by E. ¼ E.		North.		N.N.E.		N. by E.	
Before High Water, Dover.	5 N.E.	Greatest rate 1/3 knot about half tide.	N. by E.	Greatest rate ¼ knot about half tide.	N.E. ¾ E.	Greatest rate ¼ knot about half tide.	N.E. ¼ E.	
	4 N.E.		N.N.E. ¼ E.		N.E. by N.		N.N.E. ¾ E.	
	3 N.E. ¼ E.		N.E. ¼ E.		N.E.		N.E. by E. ¼ E.	
	2 E. ¾ N.		E. by N.		N.E.		N.E. by E. ¾ E.	
	1 East.		E. by N.		N.E.		E.N.E. ¼ E.	

COMPARTMENT XX.
On the parallel of 58° N.

Hours.	3° W.		2° W.		1° W.		°		
	Course.	Rate.	Course.	Rate.	Course.	Rate.	Course.	Rate.	
After High Water, Dover.	1 South.	Greatest rate 1 knot about half tide.	S.E.	Greatest rate 0.6 knot about half tide.	S.S.W.	Greatest rate 1 knot about half tide.			
	2 S.E. ¾ S.		S.E.		S.S.W.				
	3 East.		S. ¼ E.		S.S.W.				
	4 E. by S.		S.E. ¾ S.		Slack.				
	5 Slack.		Slack.		N.N.W. ¾ W.				
	6 S.W.		N. by W.		N.N.E.				
Before High Water, Dover.	5 W. ¼ N.	Greatest rate 1 knot about half tide.	N.W. ¼ W.	Greatest rate 0.6 knot about half tide.	N.N.E. ¾ E.	Greatest rate 1 knot about half tide.			
	4 W.N.W. ¼ W.		N.W.		N.E.				
	3 N.W. by W. ½ W.		N.W. by N.		N.E. ¾ E.				
	2 W. by N.		W. ¼ N.		S.S.E. ¼ E.				
	1 W. ¾ N.		S. ¾ E.		S.S.E. ¾ E.				
Hours.	1° E.		2° E.		3° E.				
	Course.	Rate.	Course.	Rate.	Course.	Rate.			
After High Water, Dover.	1 S.W.	Greatest rate ½ knot about half tide.	S.W.	Greatest rate ½ knot about half tide.	S. by E.				
	2 West.		W.S.W.		S. ¾ E.				
	3 Slack.		W.N.W. ¼ W.		S. ¾ W.				
	4 Slack.		N.W. ¼ N.		S.S.W.				
	5 N.N.E.		N. ¾ E.		S. ¾ W.				
	6 N.N.E.		N. by E.		E. by N.				
Before High Water, Dover.	5 N.N.E.	Greatest rate ½ knot about half tide.	N. by E.	Greatest rate ½ knot about half tide.	E.N.E.				
	4 N.N.E.		N. by E. ¼ E.		E.N.E.				
	3 N. by E. ¾ E.		N. by E.		E. by N.				
	2 Turning.		N.E. ¼ E.		E.S.E. ¼ E.				
	1 W. by N. ¼ N.		S.E.		S.E. by E.				

TIDAL STREAMS.

COMPARTMENT XXI.

On the parallel of 59° N.

Hours.	2° W.		1°		°	
	Course.	Rate.	Course.	Rate.	Course.	Rate.
After High Water, Dover.	1 S.W. by S.	Greatest rate 1 knot about half tide.	S.S.W. ½ W.	Greatest rate 0·6 knot about half tide.	W.S.W.	Greatest rate ¾ knot about half tide.
	2 S. by W. ¾ W.		S.W. by S.		W.S.W. ¾ W.	
	3 S. ¾ W.		S.W. by S.		N. by E. ½ E.	
	4 S.W. by W. ½ W.		Slack.		N.E.	
	5 W. by N.		Slack.		N.E. ¾ E.	
	6 N.W. ½ W.		N. ¾ E.		N.E. by E.	
Before High Water, Dover.	5 N.N.W. ¾ W.	Greatest rate 1 knot about half tide.	N.N.W.	Greatest rate 0·6 knot about half tide.	N.E. by E.	Greatest rate ¾ knot about half tide.
	4 N.W. ¾ N.		N.N.W.		E. by N.	
	3 W.N.W.		N.W. by N.		S.E. ¾ E.	
	2 S.W. by W. ½ W.		S.W. by W. ¾ W.		S.S.W. ½ W.	
	1 S.W. ¾ W.		S.W. ¾ S.		W.S.W.	

All the foregoing bearings are magnetic.

TIME
OF
HIGH WATER ON FULL AND CHANGE DAYS;
WITH THE RISE OF THE TIDE
AT SPRINGS AND NEAPS.

AUTHORITIES.

Admiralty Charts. Alldridge, Barnett, Bate, Bayfield, Beaufort, Becher, E. J. Bedford, G. A. Bedford, F. W. Beechey, R. B. Beechey, Belcher, Biddlecombe, Blackwood, Boteler, Brooker, Bullock, Burdwood, Calver, Church, Collinson, Cox, Dayman, Denham, Drury, Edye, Evans, Fitz-Roy, Flinders, Frazer, Hewett, Hoskyn, Hutchison, Jeffery, Kellett, King, Lawrance, Lord, Mackenzie, Mooney, M'Dougall, Mudge, Orlebar, Otter, Owen, Parry, Raper, Reed, G. H. Richards, J. Richards, Robinson, Roe, Ross, Sheringham, Shortland, Skead, Slater, Spence, Stanley, Stanton, Stokes, Sullivan, Thomas, Vidal, Ward, Washington, White, Wickham, Williams, Wolfe, Wood, and Yule, of the Royal Navy; and Blair, Constable, Haines, Horsburgh, Moresby, Robinson, Ross, Stiffe, Wales, and Ward, of the Indian Navy. Maclear, H.M. Astronomer at the Cape of Good Hope.

Pilote Français. Beautemps-Beaupré, Bégat, Bougainville, Chazallon, D'Entrecasteaux, D'Urville, Duperrey, Givry, La Pérouse, and Roussin of the French Navy.

Bellingshausen, Krusenstern, Lisiansky, and Lütke of the Russian Navy.

Tasman, Melville, Smits, Swart, and Van Rhyn of the Dutch Navy.

Klint, Löwenorn, and Zahrtmann of the Danish and Swedish Navies.

Bauza, Malaspina, and Tofiño of the Spanish Navy.

U. S. Coast Survey under Professor A. D. Bache. Maury and Wilkes of the U. S. Navy.

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As it is desirable that the following list should be made accurate and complete, it is requested that corrections and additions be forwarded to the Secretary of the Admiralty.

TIME

OF

HIGH WATER ON FULL AND CHANGE DAYS

AT THE PRINCIPAL PLACES ON THE GLOBE ;

GED ACCORDING TO THE APPARENT PROGRESS OF THE TIDE WAVE ;

*With the Rise of the Tide at Springs and Neaps.**

ery, thus ?, is placed after the Time of High Water and the Rise, it indicates that what are given are approximations.)

e.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>England, South Coast.</i>					h. m.	ft.	ft.
St. Agnes)	4 30	16	12	Teignmouth -	6 0	13	9½
St. Mary)	4 27	16	12	Torbay -	6 0	13½	10
Trescow)	4 22	16½	12½	Exmouth -	6 21	12½	8½
-	4 30	16½	12½	Lyme Regis -	6 21	11½	8½
Perran }	5 0	14½	10½	Bridport -	6 5	11½	7½
ve) - }	4 35	14½	11½	Chesilton -	6 13	10½	7
-	4 43	15½	11½	Portland Breakwater	7 1	6½	4½
Trance)	4 57	16	12	Poole - {	9 10	6½	4½
-	5 0	15½	11½	- {	12 45		
Truro }	5 5	10	6	Christchurch - {	9 0	5	
Quay) - }	5 4	15½	12	- {	11 30		
-	5 14	15	11½	Needles Point -	9 46	7½	5
-	5 26	16	13	Hurst, Camber - {	10 0	7½	6
Breakwater	5 37	15½	11½	- {	12 0		
utton }	5 32	15½	11½	Yarmouth -	10 0	7	6½
- }	5 43	15½	11½	- {	12 0		
Dk. Yard	5 45	15	11	West Cowes - {	10 45	12½	9½
Tamar	5 47	14½	10½	- {	11 45		
"	5 55	13½	9½	Lymington - {	10 25	8	6
"	6 6	12½	8½	- {	12 15		
m "	6 12	10½	6½	Beaulieu -	10 25	10	8½
"	6 17	5½	1½	- {	12 15		
Quay, }	5 47	14½	10½	Calshot -	11 30	13	9½
. Tavy }	5 47	8½	4½	(Castle Point) }	10 30		
"	5 37	16½	11½	- {	12 45	13	9½
R. Yealm	5 40	16½	11½	- {	10 42	8½	6
R. Erme	5 47	16½	11½	bridge -	12 57		
R. Avon	5 45	15½	11½	Portsmouth Dock }	11 41	12½	10
-	5 41	15	11½	- {			
Kings- }	5 46	10		Yard -			
- }	6 16	14½	10½	- {			
				chester (off the	11 46	13½	10½
				Castle) -			
				Ports-			
				bridge (a ½ mile	11 48	6½†	4†
				W. of bridge) -			

* Rise of the tide is meant its vertical rise above the mean low water level of spring-tides.

† Above the bed of the lake.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neap
	h. m.	ft.	ft.		h. m.	ft.	ft.
Portsmouth Fareham (in Channel close to the Upper Quay) -	11 48	11½	8½	Caermarthen (Bar)	6 10	26	19½
Bridge -	11 51	7½	4½	Caldy Island -	6 0	24½	16½
Ryde -	11 20	13½		Tenby -	6 0	27	20
Bembridge Point -	11 0	14	10½	Milford (St. Ann Lighthouse) -	5 56	24	18
Chichester -	11 30	11	11	Pembroke Dk. Yard	6 12	21	15½
Pagham (entrance)	11 30	16½	12½	Benton Castle, Cleddau R. }	6 23	20	14½
Selsea Bill -	11 45	16½	12½	Landshipping " }	6 27	20	14½
Littlehampton -	11 36	16	11½	Little Milford Quay " }	6 31	18	13½
Arundel (Bar) -	11 35	16	11½	Haverfordwest " }	6 42	7½	2½
Arundel (Town) -	12 25			Smalls Light-house " }	6 0	21	
Shoreham -	11 34	18	13½	Ramsey Sound -	6 0	17	
Brighton -	11 15	19½	16	Fishguard -	6 56	11½	9½
Newhaven -	11 51	20	15	Newport -	7 0	12	9
Beachy Head -	11 20	20	15	Cardigan -	7 1	12	9
Hastings -	10 53	24	17½	New Quay -	7 30	15	
Rye Bay -	11 20	22	17½	Aberystwyth -	7 31	13½	10
Dungeness -	10 45	21½	19	Aberdovey -	8 0	15	
Folkstone -	11 7	20	16½	Sarn-y-bwch Reef -	7 40	14	
Dover -	11 12	18½	15	Barmouth -	7 41	17	13½
Dartford -	11 15	16	12½	Sarn Badrig -	7 30	13	
Ramsgate -	11 44	15	12	Port Madoc -	7 30	17	
<i>England and Wales, West Coast.</i>				St. Tudwall Road -	7 45	14	
Scilly Isles (St. Agnes) -	4 30	16	12	Pwllheli -	7 46	13½	9½
Scilly Isles (St. Mary) -	4 27	16	12	Bardsey Id. -	7 40	15	
Cape Cornwall -	4 35	18½	11½	Porth-dyn-Ileyn -	8 30	16	
St. Ives -	4 44	21	15	Caernarvon -	9 33	13½	10½
Padstow -	5 13	20½	16½	Holyhead -	10 11	16	12½
Boscastle -	5 15	25	17½	Amlwch -	10 30	18½	13½
Budehaven -	5 45	23	17	Beaumaris -	10 32	21½	16½
Lundy Island -	5 15	27	20	Air Point, R. Dee	10 54	25	19
Barnstaple (Bar) -	5 30	19	14	Chester (Crane Wharf) -	12 16	26	
Barnstaple (Bridge)	6 28	10½	7½	Liverpool -	11 23	26	20½
Appledore -	5 58	23	16½	Formby Point -	10 35	28	
Bideford -	6 7	16	11	Ribble Lighthouse	10 51	24	17
Ilfracombe -	5 42	27½	21½	Preston -	11 49	10	4
Minehead -	6 30	35	28½	Fleetwood (Wyre Lt) (Port)	11 11	27	20½
Bridgewater Bar -	6 50	35	26½	" (Port)	11 12	26½	19½
Weston-super-mare	6 54	37	28½	Lancaster -	11 16	8½	
Flatholm Islands -	6 54	37½	28½	Poulton-le-Sands -	11 26	27½	21½
Portishead -	7 16	41½	31	Piel Harbour (Pier)	11 5	28	21
Bristol (King Road)	6 56	44	33	Whitehaven -	11 14	23½	18½
Chepstow -	7 30	38	28½	Port Harrington -	11 5	26	19
Newport -	7 10	38	29	Workington -	11 4	20	15
Cardiff -	6 59	38	29	Maryport -	11 3	18	13
Nash Point -	6 25	33	25	Abbey Head -	11 10	23	17½
Swansea (Mumbles Lighthouse) }	6 1	27½	20½	Southernness -	11 20	28	
Porth Cawl -	6 8	28½	21½	Annan Foot -	11 56	20	14
Burry Port -	6 1	25½	18½	Port Carlisle -	12 10	20	14
Ferry Side -	5 49	23	16½	Point of Ayr -	11 7	20½	16½
Llanelly (Bar) -	6 16	28	21	Douglas, I. of Man	11 12	20½	16
				Ramsey " "	11 12	19½	16
				Peel " "	11 8	16½	13
				Calf Sound " "	11 17	16½	13
				Port St. Mary " "	11 10	20	16
				Castletown " "	11 10	20	16

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Scotland, West Coast.							
	h. m.	ft.	ft.		h. m.	ft.	ft.
Farn Point)	11 22	23	18	Duart, I. of Mull -	5 0	12	10
right -	11 10	23		Loch Aline -	5 33	13½	10½
Stewart }	12 0	12	6	Tobermory, Mull I.	5 36	13	9½
Quay) -	11 30			Loch Cuan " -	5 36	13	9½
wn -		17	12	Loch Sunart -			
liam -	11 10	18	10	Iona Sound -	5 11	11½	8½
alloway -	11 15	15½	12½	Bunessan -	5 24	12	8½
ick -	11 10	15	12	Loch Tuadh (Go-	5 29	11½	8
an -	11 12	11	8	metra) I of Mull }			
Antyre -	10 35	4		Soarnish, Tiree I.	5 31	11½	8½
ton -	11 45	8½	6	Arinagour, Coll I.	5 41	12½	9½
-	11 49	10	7	Loch Moidart -	5 44	13½	9½
-	11 50	8½	7½	Eigg Island -	6 15	14	10
-	11 50	10	7½	Arasaig -	5 50	13½	10
n -	11 45	10	8	Loch Nevis -	5 47	14½	10
Head -	11 49	10		Loch Houra -	5 45	13½	10½
Great }	11 50	10	6	Ornsay, I. of Skye	5 50	14½	10½
nd -	11 50	10		Kyle Rhea -	6 0	15	11
-	0 8	9½	8½	Loch Duich -	6 0	15½	11
gow -	0 18	9		Loch Alsh (Kyle	6 16	15½	11
on -	0 20	9		Akin) -			
-	0 39	11		Loch Carron }	6 29	16½	11½
Canal Ent.)	1 15	9	7½	(Plockton) -			
-	1 25	9		Portree, I. of Skye	6 32	15	10½
ig -	12 6	12	6	South Rona, Light	6 20	14½	10½
l -	12 6	10		House -			
van -	11 55	6		Loch Torridon -	6 20	15	11
s, Kyles }	11 50	10	8	Barra, North Harb.	5 48	11½	8½
-	11 50	11	6	Canna Island -	6 19	14	9½
s -	11 50	11	6	Loch Boisdale, }	5 47	13½	9½
g, Loch }	11 53	9	7½	South Uist -			
-	12 0	10		Benbecula -	6 3	11½	8½
und -	2 22	4	2½	Loch Skipport -	5 32	12½	9
n, Islay -	5 0	5	4	Loch Dunvegan }	6 7	15½	11
lin Ferry	4 41	6½	4½	(Dunvegan Cas-			
all Isles -	5 3	3½	2½	tle, I of Skye) }			
-	4 49	6½	5	Kallin, North Uist	5 59	13½	9½
land -	5 2	11½	7	Monach Is. (Shillay)	5 44	12½	8½
(Schal- }	5 18	11	7½	Loch Eport, N. Uist	6 6	12½	9½
-	5 28	10	7½	Loch Maddy, }	6 6	12½	9½
ound -	5 10	10-12		North Uist }			
an, Loch }	5 31	9	6½	Vallay -	6 10	11½	8½
n -	5 22	12	9½	Berneray L. (Sound	6 11	13	
l, Loch }	7 3			of Harris) -			
-	7 54	5½		Obb of Harris -	6 16	11½	8½
in, Loch }	5 26	12½	8½	East Loch Tarbert	6 10	13½	10
ish, -	5 43	11		West Loch Tarbert	6 4	11½	8½
evan -	5 43	12	8½	Loch Seaforth }	6 16	15	10
och Aber	5 59	11½		(Athline) -			
Head of }	6 27			Loch Clay " -	6 9	14½	9½
-				Loch Ewe (Poolewe)	6 39	14½	10½
				Loch Broom }	6 40	14½	10½
				(Ullapool) -			
				Tanera, Summer I.	6 37	14	10½
				Loch Inver -	6 41	14	11
				Loch Erisort, }	6 43	15½	11½
				Lewis Id. -			
				Stornoway " -	6 46	13½	9½
				Loch Roag (Ber-	6 11	11	8
				nera) Lewis I. -			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
St. Kilda -	5 30			<i>England, East Coast.</i>			
Rockall -	3 30	12		Holy Island Harb.	2 30	15	11½
Loch Laxford -	6 44	15	11½	North Sunderland	2 30	15	11½
Cape Wrath -	7 30	15½		Coquet Road -	3 0	14½	11
Loch Eriboll -	7 43	14½	11	Blyth -	3 15	15	11
Loch Tongue -	7 53	15	12	Tyne River (Bar)	3 20	14½	11
Thurso -	8 28	14½	11	" North Shields	3 23	13½	10
Stroma, S. side -	9 47	9	6½	(Low L. Hse.)			
Swona, E. side -	10 24	10	7½	" Howden -		12	
" W. side -	9 35	10	7	" Walker -		10½	
Great Skerry, E. side -	11 4	9½	6	" Newcastle -	4 23	10½	
" W. side -	10 53			Sunderland -	3 22	14½	11
<i>Orkneys.</i>				Seaham -	3 24	14½	10½
Stromness -	9 0	10	7½	Hartlepool -	3 28	15	11½
Westness -	9 11	10	7½	Tees River, Bar -	3 45	15	
Kirkwall -	10 9	10	7½	" Middlesbrough	3 55	13	
Deer Sound -	10 30	10	7½	" Stockton -	4 40	11	
Widewall -	9 3	10	7½	Whitby -	3 45	15	11½
Otterswick -	9 13	11	8	Scarborough -	4 11	15½	12½
<i>Shetland Isles.</i>				Pile Bay -	4 20	16	12½
Balta -	9 45	6	4½	Flamborough Head	4 30	16	12
Lerwick -	10 30	6	4	Bridlington -	4 39	16	12
Hillswick, or Urie	9 45	6½	5	Humber River, } Spurn Point - }	5 26	19½	15
Firth -				" Grimsby -	5 36	19½	15
Sealloway -	9 30	5½	4½	" Killingholme	6 2	19½	15½
Sumburgh Head -	9 45			" Hull -	6 29	20½	16½
Fair Isle -	11 0	5	3	Humber Ouse } River, Goole }	7 44	14	
<i>Scotland, East Coast.</i>				Boston Deep, Clay } Hole - }		21½	
Duncansby Ness -	10 14	10	7	" Hob Hole -		17	
W. Ness -	11 22	10	7½	" (Sluice) -	7 0	12	
Dornock Road -	11 47	11		Lynn Deep, Long } Sand - }	6 0	23	
Cromarty -	11 56	14	11	" Lynn Road -		20	
Inverness (Kellock } Pier) - }	12 18	12	9½	" Lynn -		18	
U. Ness -	0 28	10½	8	Wisbeach Eye -		20	
Fraserburgh -	0 40	11	8½	Sutton Bridge -		18	
Peterhead -	0 34	10½	8½	Wisbeach -	7 30	15	
Aberdeen -	1 0	12	10	Wells Bar -	6 20	18	
Stonehaven -	1 10	14	11	Wells -	7 0	12	
Montrose -	1 25	14	10	Blakeney Bar -	6 30	15	
Arbroath -	1 35	14	11	Blakeney -		9	
Tay River (Bar) -	2 6	16	14	Cley -		5½	
Broughty Ferry -	2 22	14½	11	Cromer -	7 0	14½	11
Dundee -	2 32	14½	11½	Leman Shoal -	6 0		
U. Ness -	3 35			Ower Shoal -	6 30		
Cockenzie, Firth of } Forth - }	2 16	15½	13	Hammond Knoll -	7 40		
Leith -	2 17	16½	12½	Winterton Ridge -	7 50		
Granton Pier -	2 20	16	12½	Yarmouth Road -	9 15	6	4
Burntisland -	2 24	16½	12½	" Haven, Brush		5½	4½
Queensferry -	2 37	18	14	" Bridge -		5	4
Kinncardine -	2 53	17½	15	Lowestoft -	9 57	6½	3½
Alloa -	3 18	17½	15	Blyth River, South } wold - }	10 20	6½	4½
Stirling -	3 52	7½	4½	Aldborough -	10 45	8½	6½
Dunbar -	2 8	14½	11	Kentish Knock -	11 47		
Eyemouth -	2 15	15½	11½	Orfordness -	11 15	8	6½
Perwick -	2 18	15	11½				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Youghal	11 30	8 7	6 7	Ballinacourty, } Dungarvan	5 14	12 1/2	10
Wexford Bar	11 30	7 1/2		Dunmore	5 12	12 1/2	9 1/2
Wexford	12 36	7 1/2		Waterford (Dun- cannon Fort)	5 27	12 1/2	9 1/2
Wexford Bridge	1 0	7 1/2		Waterford (Bridge)	5 20	12 1/2	10
Wexford Haven	3 0	7 1/2		New Ross	6 6	13 1/2	10 1/2
Wexford Quay	11 45	12		Saltees	6 4	12 1/2	10
Wexford Bridge	12 35	10		Wexford	5 40		
Wexford Harbour	12 55	7		Kilmichael Point	7 21	5	3 1/2
Wexford	12 6	11 1/2	9 1/2	Arklow	8 30	4 1/2	3
Wexford	12 6	12 1/2	10	Wicklow	8 45	4	3
Wexford, Pin- hill	12 20	12		Bray Head	10 29	9	6 1/2
Wexford, Pin- hill	12 27	12		Dulkey Island	10 45	12	9 1/2
Wexford, Pin- hill	12 27	12		Kingstown	10 45	11	11
Wexford, Pin- hill	12 35	13 1/2		Dublin Bar (Pool- beg Lt. House)	11 10	11	8 1/2
Wexford, Pin- hill	12 29	11		Howth Harbour	11 12	12 - 14	9 - 11
Wexford, Pin- hill	12 29	11		Malahide Inlet	11 9	11	10
Wexford, Pin- hill	12 48	11 1/2		Rogerstown Inlet	11 15	11	8
Wexford, Pin- hill	1 8	4 1/2		Skerries Islands	11 15	10 1/2	8
Wexford, Pin- hill	1 8	4 1/2		Balbriggan	11 0	13	10
Wexford, Pin- hill	13 0	14	10	Drogheda (Bar)	10 40	11	
Wexford, Pin- hill	12 10	15	10 1/2	Dundalk	11 0	11 1/2	9
Wexford, Pin- hill	12 0	14 1/2	10	Greencastle Point	10 56	13 1/2	11 1/2
Wexford, Pin- hill	12 0	14 1/2	10	Carlingford (Bar) or Cranfield Point.	11 2	14	11 1/2
Wexford, Pin- hill	12 20	12	8	Warrenpoint	11 0	11	11
Wexford, Pin- hill	12 32	10	6	Newcastle	11 10	14 1/2	12
Wexford, Pin- hill	12 32	10	6	Ardglass	10 30	16	12
Wexford, Pin- hill	11 40	12	6	South Rock	11 0	16	12
Wexford, Pin- hill	11 40	12	6	Lough Strangford	10 58	13	10 1/2
Wexford, Pin- hill	12 5	14 1/2	10 1/2	(Killard Point)	10 53	11	11 1/2
Wexford, Pin- hill	12 25	16	11	" Strangford	10 53	11	11 1/2
Wexford, Pin- hill	12 5	14 1/2	10 1/2	" Quay	12 31	10 1/2	8 1/2
Wexford, Pin- hill	11 40	15 1/2	13	" Quoile Quay	12 45	11	9 1/2
Wexford, Pin- hill	12 0	15 1/2	13	" Kireubbin	12 42	11 1/2	9 1/2
Wexford, Pin- hill	12 30	15 1/2	13	" Killyleagh	12 40	11	9 1/2
Wexford, Pin- hill	0 57	16	13 1/2	Head of the Lough	12 44	11 1/2	9 1/2
Wexford, Pin- hill	1 2	17 1/2	14	(Turley Rocks)	12 44	11 1/2	9 1/2
Wexford, Pin- hill	1 10	17 1/2	14				
Wexford, Pin- hill	1 37	18 1/2	15 1/2				
Wexford, Pin- hill	1 43	19	15				
Wexford, Pin- hill	1 57	19 1/2	17				
Wexford, Pin- hill	2 7	19 1/2	16 1/2				
<i>Ireland, South and East Coasts.</i>				<i>Ireland, West Coast.</i>			
Wexford, Pin- hill	4 0	9	6 1/2	Cape Clear	4 0	9	6 1/2
Wexford, Pin- hill	4 23	10 1/2	8 1/2	Skull	4 2	9 1/2	7 1/2
Wexford, Pin- hill	4 21	10 1/2	8	Crookhaven	4 9	9 1/2	8
Wexford, Pin- hill	4 30	11	8 1/2	Dunmanus Harbour	3 57	9 1/2	7 1/2
Wexford, Pin- hill	4 36	10 1/2	8 1/2	Dunbeacon	3 51	10 1/2	7 1/2
Wexford, Pin- hill	4 43	11 1/2	9	Black Ball Harbour	3 40	9 1/2	7 1/2
Wexford, Pin- hill	5 1	11 1/2	9	Castletown, Bear- haven	4 14	9 1/2	7 1/2
Wexford, Pin- hill	4 58	12 1/2	10	Bantry Harbour	3 47	10	7 1/2
Wexford, Pin- hill	4 54	12	9 1/2	Kenmare R., Bal- lycrovane	3 42	10 1/2	7 1/2
				" Dunkerron	3 45	10 1/2	8
				" Ormond	3 43	10	7 1/2
				" West Cove	3 52	10	7 1/2
				Ballinskellig Bay	3 40	11	7 1/2

Loc.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Bessin -	8 57	20	15½	Elbe, Hamburg -	5 29	6½	
les -	9 7	20	15½	Eider, Tønning -	2 1	9	
m -	9 38	21	16	" Friederich- stadt -	2 37	9	
-	9 36	21	17½	Eider, Rendsborg -	7 42	4	
-	9 39	21	16	Husum -	2 36	9	
uf -	9 29	23½	11	List -	2 21	6	
-	10 6	9½	7½	Hierling -	2 45	5	
-	10 57			Nyminde Gab -	2 41	2	
-	9 51	22	10	Thoraminde -	3 34	2	
-	2 28			Blaavand or Horn Point -	1 44	5	
y-en-Caux -	10 44	23½	18	Aggerminde -	4 9	2	
-	10 46	27	21½	Hirtshals -	4 28	1	
-	11 6	27	20½	Skagen or the Skaw -	5 56	1	
-	11 9	27	21	Bergen -	1 30	4	
-	11 5	27½	21	Romdals Islands -	10 45	6	
-	11 26	27½	21	Ramsø Fiord -	10 45	7	
lery-sur- e. }	11 46	27	21½	Oxboasheim, Svec Fiord -	12 0	8	
s -	11 25	25	19½	Trø Islands -	11 45	7	
snez -	11 27	21½	16½	Værø -	12 0	9	7½
-	11 49	19½	15½	Lofoten Islands -	12 0	9	7½
cs -	12 0	17	15	Tromsø -	1 45	8	
ue -	12 8	16½	13½	Hammerfest -	1 10	9	
<i>North Sea, East Coast.</i>				<i>Færoe Islands.</i>			
-	12 18	11	13	Fugløe Fiord -	11 15	6½	4½
-	12 25	19	15	Svinøe Fiord -	12 0	6½	4½
berg -	12 48	13	11	Leervig Fiord -	0 30	6½	4½
-	3 15	15		Miaveness -	3 12	6½	4½
-	1 20	15		Naalsøe Fiord -	4 0	6½	4½
-	4 25	15		Skaaspen Fiord (be- tween Stormøe and Sandøe) -	5 0	9½	7½
spot -	1 20	15	8	" (between Hestøe and Sandøe) -	5 30	9½	7½
-	12 30	12	9	Waagøe Fiord -	6 0	9½	7½
shaven -	2 0	11	8	Westmanshaven -	8 0	9½	7½
West Gat) -	2 15	10		Suderoe Fiord -	6 0	9½	7½
alsnis -	1 45	7	6	Myggenæs Fiord -	9 0	9½	7½
-	2 30	6		Eides Fiord -	11 0	9½	7½
-	3 0	5		<i>Iceland.</i>			
m -	3 45	7		Reikiavik -	5 0	17½	13½
-	2 30	5		<i>Lapland.</i>			
tside shoals) -	6 30	4	3½	Liza Bay -	5 58	9	
-	7 0	12		Nova Zembla Harb. -	6 36	10	
liep -	7 27	11	3½	Jekatarina Islands -	6 23	10	
lling (West) -	8 40	6		Kildin Island -	6 45	12	
l Gat -	9 0	7		Habitable Island, } Seleney Bay - }	7 9		
ollum Rd. -	11 30	7		Teriberka River -	7 20	12	
er buoy) -	10 0	8-10		Olenji Islands -	7 30	12	
(road) -	10 30	8-10		Charlowka River -	8 8	12	
-	11 15	8-10		Seven Islands -	8 20	12	
-	12 0			Jukan Islands -	9 0	13	
ey -	10 30			Sviatoi Nos -	9 15	14	
inter light }	11 30						
-							
Oog -	12 0	12	7				
rd -	11 33	9½					
rance -	12 0	11					
ixhaven -	1 8	10					
unobattel -	1 58	9					
uckstadt -	3 9	10					
tona -	5 19	7					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
White Sea.					h. m.	ft.	ft.
Inkanskie -	9 15	14		Walvisch Bay -	1 54	6	
Turna Bay -	9 54	11		Port Alexander -	3 0	5	
Trek Island -	10 48	20		Great Fish Bay -	2 30	5 - 6?	
Litke Bank -	11 45	15		Little Fish Bay -	2 30		
Cape Kanushin -	11 54	15		Lobito Bay -	2 20	5	
Sosnovets -	11 44	18		Benguela -	2 30	5?	
Morjovets I. -	11 20	17		St. Helena Island -	3 11	3	
Cape Voronov -	11 20	17		Ascension Island -	5 30	2	
Intsi Point -	11 55	16		San Paul de Loanda -	4 30	5	
Kouloi River -	1 15	20		River Congo -	4 30	6	
Mezen -	1 48	15 - 22		Mayumba -		7	
Kerets Point, Gulf } of Arkhangel - }	4 30	5½		River Gaboon -	5 30	3	
Nikolskoi Tower „	6 0	2		Cape Lopez -	4 30	4 - 6?	
Moudinga I. „	5 50	3½		Corisco Bay } (Elobey Isles) - }	5 0	7	
Dvina Bar -		3½		Anno Bom Id. -	3 45	5	
Arkhangel „	7 28	2½		St. Thomas Id. -	3 25	4½	
Nikolskoi Chan. „	5 25	3		Princes Id. -	3 45	4½	
Gribanika Pt. „	4 50	3		Fernando Po -	4 0	7	
Jijginsk I. -	5 15	4		Cameroon River -	4 0?	6	
Cape Orlov Letni, } Gulf of Onega - }	5 18	4		Bonny and New } Calabar Rivers- }	5 0	9	
Onega River -	9 17	6 - 7		Brass River -	4 0	6	
Souma -	6 30	5½		River Niger, Nun } (entrance) - }	4 8	6	
Solovet Road -	5 0	4		„ Benin -	4 30	7	
Kyem River -	5 23	4		„ Middleton -	4 15	5	
Kalgalakska -	6 50	7		„ Pennington -	4 15	5	
Keret, Gulf of } Kandalak - }	3 8	6		„ Dodo -	4 17	5	
Kovda Bay -	3 25	6		„ Ramos -	4 20	5	
Kandalaksha „	3 25	7		„ Forçados -	4 22	5	
Sosnovaia Bay „	2 40	6		„ Lagos (Bar) -	6 0	3	
Kou Zomen -	3 30	6		„ „ Consulate } Wharf }		2	
Tetrina -	3 17	7		„ Palaver Ids. -		1	
Nova Zembla.				Cape Coast Castle -	4 30	6	
Hakluyt Head -	1 30	4		St. George d'Elmina -	4 30	6	
Spitzbergen.				Cape Three Points- Axim -	4 0	4	
Bell Sound -	8 56	3½		Grand Lahou -	4 30	4	
Africa, West Coast.				Tabou River -	4 20	4	
(From Cape of Good Hope to the Northward.)				Cape Palmas -	4 45	3 - 4	
Simons Bay -	2 44	5½	3½	Sinou -	4 30	4	
Hout Bay -	2 20	5		Sangwin River -	5 0	4	
Table Bay -	2 40	5		Grand Cestos -	5 15	4	
Saldanha Bay -	2 0	6		Edina -	5 20	4	
St. Helena Bay -	2 30			Junk River -	5 50	4	
Roodewall Bay -	2 30	6½		Monrovia -	5 45	5	
Hondenklip Bay -	2 30	5½		Gallinas River -	6 0	6	
Mc. Dougall Harb. -	2 30	5½		Gilmorris Id. } Sherbro River- }	6 45	4	
Port Nolloth -	2 30	5½		Edmonstone Id. „	6 0	11	
Elizabeth Bay -		5 - 6		Bagroo River „		8	
Angra l'equena -	2 30	8		Banana Islands -	8 15	11	
Ichabo Island -	1 0	6	4	Sierra Leone -	7 55	9	
Spencer Bay -	10 50	5 - 6		Yellaboi Island -	7 10	8	
Port d' Ilheo -	3 0	8 - 10		Scarcies Rivers -	7 10	10	
				Mellacoree R. -	7 40	10	
				Forecarreah R. -	7 40	11	
				Mahneah R. -	7 40	11	
				Isles de Los -	6 35	11	

No.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
ga -	7 30	12	9½	Mondego (Bar) -	11 10	7	
z -	10 0	15	11½	Oporto -	2 30	10	
pones -	10 0	15	11½	Fayal, Azores -	11 45	4	
la., Or- } annel - }	10 0	11		Terceira " -	12 32	4½	
Arcas } Bisno- }	10 10	11 - 14	9	St. Michael " -	12 30	6	
beo -	11 0	■		Funchal Bay, Ma- } deira - }	12 48	7	
bia -	7 45	8		Vigo -	3 0	12 - 13	
iver -	8 10	6 - 9		Cape Finisterre -	3 0		
r -	8 10	6		Port Camariñas -	3 0	18	
-	7 45	2½		Corunna -	3 0	15	
Bar) -	8 42	6		Ferrol -	3 0	15	
(Guet } r'dar) - }	8 42	6		Cedeira -	3 0	15	
St. Louis) -	10 0	■		Vivero -	3 0	15	
rde Ida. -	7 45	5		Rivadeo -	3 0	15	
ya " -	6 0?	5		Barquero (entrance) -	3 0	15	
-	10 0	6		Gijon Bay -	3 15	15	
ay -	12 0	6 - 7		St. Martin de la } Arena - }	3 30	15	
r -	12 0	8 - 9		Santander -	3 30	15	12
co -	11 46	6		Santona -	3 30	12½	10½
odor -	12 0	8?		Bilbao (Bar) -	3 0	13	
-		8		Olaveaga -	3 15	19	
ary Ids. -	12 30?	9?		Bilbao (Town) -	3 20	9	
" -	12 30?	9?		St. Sebastian -	3 0	12	9
" -	12 45?	9?		Port Pasages -	3 0	12	9
" -	1 0?	9?		Socon -	3 19	12½	■
Tenerife -	1 30	8	6	Bayonne (Bar) -	3 45	■	10½
la Luz, } anaria - }	12 52	10		Boncaut, Adour R. -	3 39	8½	6
uz or } in - }	12 45	9		Arcachon -	4 37	11½	9½
-	1 18	10 - 12		Cordouan Lt. house -	3 37	11½	10½
-	10 0	10		Royan -	3 38	13½	10
-	1 46	9 - 12		St. Surin -	4 11	14½	11
-	1 30	9 - 12		Bordeaux -	6 50	14	12½
-	1 42	■		Ile d'Aix, Charente } R. Entrance - }	3 20	17	12½
-	2 6	3½	2½	Ile d'Oleron -	3 50	19	
-	2 23	2½	1½	Roche fort -	4 6	17	■
letta) -	3 10	7	■	Rochelle -	3 31	17	13
				Les Sables d'Olonne -	3 26	14	10
				Seudre River (en- } trance, - }	3 31	15	11½
				Ile d'Yeu -	3 6	14½	10
				Ile de Noirmoutier -	3 2	16	11½
				Port Navallo -	3 42	13	9½
				St. Nazaire -	3 10	15½	11
				Port le Palais, } Belle Ile - }	3 18	14½	10½
				Port Louis, L'Orient -	3 11	■	9½
				Concarneau -	3 12	13	9½
				Penmark Rocks -	3 16		
				Glenan Ia. -	3 12	■	10
				Ile de Sein -	3 21	17½	12
				Brest -	3 47	19	13½
				Conquet Road -	3 46	21	15
				Ushant -	3 32	19½	13½
				South America, East Coast. (Cape Horn to the Northward.)			
				St. Martin Cove, } Cape Horn Ida. - }	3 50	■	
Europe, West Coast.							
	12 0	3					
old Mole -	2 20	3½					
-	1 49	4	2½				
-	1 46	6	3½				
-	1 45	9½					
-	1 24	12½	8				
i Rocks -	1 27	12½	8				
-	1 34	12½	8				
-	1 53	12½	8				
-	2 0	12½	8				
-	1 18	11½	7½				
-	2 7	13					
-	2 30	8					
Selem) -	2 30	12	9				
-	1 54						

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Prince Edward Island.</i>							
	h. m.	ft.	ft.		h. m.	ft.	ft.
East Point -	8 30	3½	2	Anticosti Island } (East Cape) - }	1 0	5	3
Cardigan Bay -	8 40	5	3½	„ Bear Bay -	1 10	5	3
Cape Bear -	9 0	6	3	„ West Point .	2 0	6	4
Charlottetown .	10 45	9½	7	Cawee Islands -	1 50	9	5
Crapaud -	10 0	8	6	Egg Island -	2 0	11	6
Bedeque Harbour -	10 15	7	5	Point de Monts -	12 0	12	6
Minimegash -	3 30	5	3	Cape Chatte -	12 0	13	8
Egmont Bay -	3 0	4	2	Godbout River -	1 52	11	6
Cascumpeque Hr. -	5 40	3	2	St. Nicholas Harb.	1 55	12	7
Richmond Harb. -	6 0	3	2	Manicouagon River	2 15	12	7
Cape Turner -	6 10	4	2	Bersimis River -	2 0	12	7
Grand Rustico -	6 40	4	2	Bic Island -	2 15	14	8½
Tracadie -	7 0	3½	2	Port Neuf -	2 10	13	8
St. Peter Harbour	8 30	4	2½	Matan River -	2 15	11	7
Boughton Harb. -	8 40	5	2½	Little Metis -	2 10	13	8
				Saguenay, Tadousac	2 45	17	10
				„ Chicoutimi	4 11	12	8
<i>Cape Breton Island.</i>				<i>River St. Lawrence.</i>			
Port Hood -	9 0	4½	2	Green Island -	2 45	16	9½
Gut of Canso } (Plaister Cove) }	9 15	4	2	Brandy Pots -	3 0	17	10
Mabou River -	9 0	4		Coudres Island } (Prairie Bay) - }	4 25	17	10
Chetican -	8 15	3½		Pillars -	5 0	17	10
Cape North -	8 0	4		Crane Island, } Middle Traverse }	5 24	17	13
St. Anne Bay -	8 34	6	4½	Orleans Island, } North Traverse }	5 40	17	13
Sydney Harbour -	8 15	5	4	Quebec -	6 38	18	13
Menadou Bay -	8 15	5½		Carouge River -	7 15	16	11
Louisburg Harb. -	8 0	5	4	Frechette Island -	8 0	14	9
St. Peter Bay -	7 30	6	4	Port Neuf -	8 30	14	9
Habitants Harbour	8 20	6½	4¾	Grondine -	9 0	9	6
Arichat -	8 10	5	4	Cape Roche -	9 30	6	4
Bear Head -	8 30	4½	3	Champlain -	9 45	3	2
Poulament Bay, } Madame Island - }	7 50	6	4	Batiscan -	9 48	3½	2
Grande-digue, „ -	7 55	6¼	4½	Antigonish Harb. -	9 0	4	2
				Three Rivers -	11 30	1	
<i>Labrador and Gulf St. Lawrence.</i>				<i>Gulf St. Lawrence.</i>			
St. Lewis Cape -	6 30			St. Paul Id. -	8 0	5	3
Fall Harbour } (Telegraph Pt.) }	6 40	3½		Magdalen Islands -	8 20	3	2
Chateau Bay -	7 35	3½	1	Gaspé Basin -	2 40	5	3
Red Bay -	7 45	3½	1½	Point Macquereau -	2 0	5	3
Bradore Bay -	8 45	4	2	Carleton Point -	3 0	6	4
Belles Amour Bay	9 0	4½	2½	Dalhousie Harb. -	3 10	9	
Bonne Esperance } Harb. - }	9 15	5	2½	Campbell Town, } Ristegouche R. }	4 0	10	7
Mistanoque -	10 30	6	3	Bathurst -	3 15	7	4
Antrobus Island -	10 30	5	3	Shippigan -	3 42	5½	3
Wapitagan Harbour	10 30	5	3	Caraquette Harbour	2 40	6	3
Coacocho Bay -	10 30	5	3	Miscou -	2 30	5	3
Kegashka Bay -	10 45	5	3	Miramichi Bar -	5 30	5	3
Little Natashquan -	11 0	5	3	Sheldrake Island -	6 0	5	3
Appetetat Bay -	11 10	5?	3?	Vin Harbour -	5 45	5	3
Betcheween Har- } bour - }	11 32	5	3	Beaubère Island -	6 30	6	4
Clearwater Point -	11 30	5	3	Point Escumenac -	4 10	4	2½
Mingan Harbour -	1 16	6	4	Richibucto River -	3 30	4	2½
Mingan Island -	1 30	6	4	Buctouche River -	7 0?	4?	2?
Bay of Seven Is- } lands - }	1 40	9	5	Cocagne River -	7 30?	4?	2?

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Newfoundland.</i>				<i>Barrow Strait.</i>			
re -	h. m.	ft.	ft.	Port Leopold -	h. m.	ft.	ft.
Harbour -	8 33	6½	4½	Erebus Bay -	12 6	6	4½
and Little	9 15	8½		Griffith Island -	12 6	8	
	8 15	7	4		12 15	3½	2½
St. Law-				<i>Melville Island.</i>			
Harbour	8 30	7	4	Winter Harbour -	1 30		
Harbour -	8 45	6½	4½	<i>Banks Land.</i>			
y Harbour -	7 40	7½	5	Bay of Mercy -		2	
Harbour -	8 0	7½	5	Prince of Wales		3	
. Mary -	9 30	7	5	Strait -			
a -	8 30	7	5	<i>Africa, South Coast.</i>			
ey Harbour	7 0	6½	5	Simons Bay -	2 44	5½	3½
ice -	7 0	6½	5	Dyer Island -	2 50	5	
is -	7 30	6	4	Cape Agulhas -	2 50	5	
r Grace -	7 30?	7?		Mossel Bay -	3 30	6	
Trinity Bay	7 22	3½	2	Nysna Harbour -	3 45	5	
Harbour	7 0	6	4	Plettenberg Bay -	3 10	6	
Harbour -	7 10?	5?		Flesh Bay or Bay			
land -	7 20	4		St. Bras -	3 30?	6?	
land -	7 0?	2-3?		Algoa Bay -	4 0	4-5	
Harbour -	7 0?	2-4?		Bird Islands -	4 0	4-5	
Harbour -	7 0?	2-4?		Waterloo Bay -	4 0	6	
: Lis Harb.	7 15	2-4		Buffalo River (en-			
Harbour -	7 0?	2-4?		trance) -	3 45	4½	
Harbour -	6 30?	4?		St. John River -	4 0	5	
nHarbour {	7 21 A.M.		3	Port Natal -	4 30	6	
ove -	6 30 P.M.	4½		Delagon Bay, Eng-			
Harbour -	7 0?	2-3?		lish River (Por-	5 20	12	
Bay -	7 0?	2-3?		tuguese Factory)			
Bays -	7 0?	2-3?		" (Port Melville)	4 30	15	
3., (N. Cst.)	7 23	2½		" Shefeen Island	4 40	12	
rb. (N. Cst.)	7 25	3?		<i>Africa, East Coast.</i>			
-Choix,	10 47	5		Inhambane River -	4 15	10	
. Coast) -				Cape Bararuto -	4 15	10	
rt, Bay of	10 42	5½		Sofala River -	4 0	19	
Is -				Quilimane River	4 15	16	
Island -	9 15	6	4	(entrance) -			
sque -	8 55	5½	3½	Zambezi River	4 30	12-15	
e Bay -	9 0	6	4	(Pearl Island)			
<i>Hudson Strait.</i>				Luabo River (entr.)		22	
Islands -	6 50			Angoxa River -		13	
nd Hecla				Mozambique Har-	4 15	12	
, Melville	7 0	8		bour -			
snla -				Pomba Bay -	4 0	11	
<i>Hudson Bay.</i>				Oibo Harbour -	4 15	6	
actory -	11 15	10-14		Mahato Island -	4 30	7	
<i>ctic Regions, Greenland, West Coast.</i>				Cape Delgado -	4 0	16	11½
asab -	5 6	7	5	Rovuma River -	4 0	16	11½
kshaab -	6 3	12½	9½	Pimlea Harbour -	4 30	12	
borg -	6 30	10		Mungullo or	4 45	12	
ik -	11 0	8		Mongallo River			
holm -	11 8	7½		Lindy River (en-	4 15	12	
				trance) -			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neap.			Spring.	Neap.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Kiswara Harbour -	4 30	12		Majambo Bay -	4 30	16	
Quilon -	4 45	12		Narrinda Bay -	4 30	15	
Latham Island -	4 0	10		Port Mazamb -	4 30	15	
Zanzibar (Channel)	4 15	11		Port Radama -	4 40	13	
Zanzibar -	4 20	10		Passandava Bay -	5 0	15	
Pemba Channel -	4 0	11		Dalrymple Bay -	5 0	15	
Port Cockburn, } Pemba Id. - }	4 15	12		Minow Islands -	5 0	15	
Melinda -	4 0	11		St. Juan de Nova -		5	
Mombaza -	4 15	11					
Lamo Harbour -	4 6	11			<i>Red Sea.</i>		
Patta Bay -	4 30	10		Bab-el-Mandeb St.	12 0	7	
Port Durnford -	4 45	12		Mocha Road (East } Coast) - }	12 0	4½	
Brava -	4 30	8		Massowah -	1 0	3	
Marka or Muerka -	4 30	8		Loheia -	1 30	3	
Magadoxa -	4 30	8		Sale Macowa -	0 30	2	
Warsheck Roads -	4 30	8		Jiddah -		3	
Ras Hafun or Ha- } foon - }	6 15	4		Murdounah Island } (East Coast) - }	6 0	3	
Cape Guardafui or } Ras Jerdaffoon }	6 15	6		Omaider Island } (Gulf of Akabah) }	6 0	4	
Bander Algleh -	6 45	6		Ras Mahommed } (Gulf of Akabah) }	6 0	5	
Bander Gori -	8 45			Ushruffi Islands -	6 14	2	
Berberch or } Burburra (Gulf } of Aden) - }	7 15	9		Suez Bay (head of } Gulf) - }	2 0	6	
Zeyla -	7 15	8½					
Ghubbet Ne, Socotra	7 0	7			<i>Arabia, S.E. Coast.</i>		
Gollonsir -	7 20	8		Bab-el-Mandeb } Strt. (Perim Id.) }	12 0	7	
Bander Shab -	7 0	7		Bander Feikam -	10 0	8½	
Abd-al-Kuri -	8 30	6		Aden & adjacent } Baya* - }	7 30 to } 9 30	7	4½
Kal Farun -	8 20	6		Sughrā -	8 0	6	
				Makatein -	9 0	6	
				Ras-al-'Asidah -	8 30	5½	
				Makalleh -	8 30	7	
				Ras Sharmah -	9 0	8	
				Merbāt -	9 0	6½	
				Kuriyān Muriyān } Bay & Islands }	8 20	6½	
				Cape Isolette -	9 0	10	
				Shāb Kadūn -	9 20	10	
				Jezirat Hamar-al- } nasfur - }	9 30	10	
				Shāb-'bu-saifeh -	9 45	10	
				Ghubbet Hashīsh -	10 0	10	
				'Om-rasas-Masīrah	10 0	10	
				Ras Shēbali -	10 0	10	
				Ras-al-Hed -	9 30	9	
				Khōr Jerameh -	9 30	10	
					<i>Persian Gulf.†</i>		
				Maskat -	11 15	6	
				Jezirat Jūn -	11 30	10	

* From a survey of Aden anchorage by Commander Dayman, R.N., H.M.S. Hornet, 1863; but, according to the Surveyors of the Indian Navy, springs at Aden rise 8½ feet.

† Deduced from observations made in the E.I.C. brig Euphrates 1857-58, and H.M. schooner Marie of the Indian Navy, 1858-60, by Commander G. C. Constable and Lieutenant A. W. Stiff of H.M. Indian Navy.

Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.
	h. m.	ft.	ft.
Kheī meh -	11 45	7	
a' - -	8 30?	6?	
n - -	5 30	7	
Arabī -	6 30?		
Kabr -		8½	
- -	0 15	9	
(Bar) -	12 0		
Kharg or } reg - - }	8 0	6½	
iehr - -	7 30	7	
en Nakheī- }	7 30?	8?	
- - }	5 0?		
Kais - -	0 45	7½	
Tumb - -		8	
- -	12 0?		
b - -	12 0	10	
- -	11 0	12	
Lārek -	10 15		
Town -	6 0?	9	
Shoal, } ochistan - }	9 30	8	
<i>Hindoostan, West Coast.</i>			
a Point (en-			
e to Karachi }	10 30	9½	6
our) - }			
Bunder }	9 50	7	
th of Indus) }			
" -	10 5	9	
r " -	10 10	8	
arry " -	9 57	9	
r River (en-	10 30	11	
ce) - }			
River (Mon-	11 40	11	
'oint) - }			
ñulf of Cutch)	12 20	12	8
- -	2 0	16	12½
a Creek }	11 0	9	
rance) - }			
vee Roads -	11 50	15	11
at -	11 35	9	7½
or (entrance,	2 15	18	13½
of Cambay) }			
land -	2 0	6	
- -	4 0	19	
m (Bar) -	1 30	17	
vah -	0 15	16	
ree River, }	3 0	18	
) - }			
vee River }	2 0	19	
rance) - }			
r R. (entr.)	1 45	18	
ary River „-	1 45	18	
l River „-	1 30	17	
ah River „-	1 30	16	
y Dockyard	11 40	12 - 17	

Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.
	h. m.	ft.	ft.
Rajahpoor Harbour	11 0	12	
Bancoot River } (entrance) - }	2 0	12	
Geriah Harbour -	2 40	9	
Angria Bank -	10 30	9	
Dewghur Harbour	11 25	9	
Goa - -	11 30	6	
Sedashigur Bay* -	10 0		
Agoada Point -	10 30	9	
Merjee River -	11 0	7	
Calicut Roads -	0 15	5	
Beypoor River(en-	0 15	5	
trance) - }			
Cochin Harbour }	1 0	3½	
and Road - }			
<i>Ceylon, South Coast.</i>			
Colombo - -	1 0	2	
Dodandowe Bay -	1 50	1½	
Pointe de Galle -	2 0	2	
Belligam or Red Bay	2 20	2½	
Kirindi - -	3 30		
Batticalao River -	5 0	2 - 3	
Trincomalie Har-	8 18	2	1½
bour - - }			
Palmeira Point -	9 30	7 - 11	
<i>Bay of Bengal, West Coast.</i>			
Tuticorin Har-			
bour and Road, }	1 15	2½	1¾
(Gulf of Manar) }			
Keelacarry -	11 0		
Paumben Pass -	1 30	2	
Kitnapatnam(West			
side of Palk }	11 0	1¼	
Strait) - }			
Negapatam -	5 0	3	
Nagore - -	8 15		
Madras Road -	7 34	3½	
Pulicat Shoals -	9 25	2¾	
False Point -	8 0	8	
Point Divy -		5	
Coringa or Coca-	9 10	4 - 5	3
nada Bay }			
" River (Bar)	9 0	5	
Balasore River -	10 0	15	
Kedgereee - .	11 30		
Saugor Island -		12	
Western light ves-			
sel (entrance to }	10 0	10¾	
Hoogly) - }			
Mutlah River, }			
Western or }	9 0	10	
Ward's Channel }			
" (entrance to }	10 0	14	
Biddah River) }			
" (Muda Kali)	11 45	15	
Calcutta -	2 30		

ing tides rise, a.m. 6 feet, p.m. $7\frac{1}{2}$ feet from October to March ; and the contrary during the rest of the year.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Bay of Bengal, East Coast.							
	h. m.	ft.	ft.		h. m.	ft.	ft.
Hastings Harbour } (Mergui Archipelago) -	10 40	13½		Comoro Islands, } (Numa-Choa, Mohilla) -	3 0	14	
Mergui -	10 30	18		„ (Anchorage, Johanna) }	3 40	11	
Tavoy River, (entrance) }	10 30	20		„ (Pomony Harbour, Johanna) -	4 0	11	9
Maulmain „ -	2 0	22	17	„ Zaudzi Anchorage, Mayotta) -	4 10	12	
Martaban -	2 20	21		Aldabra Islands -	5 0	10	
Rangoon R. (entrance)	3 15	21	14	Maldives, Adou Atoll }	1 0	4	
Rangoon -	5 30	21	14	„ Suadiva Atoll }	1 0	4	
Bassein River (entrance) - }	10 0	9	6	Maldives, Adou Matte Atoll }	3 0	4	
Ramree Road -	10 0	12		„ Malé }	12 30	3	
Kijouk Phyou Harbour - }	10 0	9	6	„ Malcolm Atoll }	10 30	3	
Akyab, Aracan River (Bar) - }	9 45	9	6	„ Heawandou Pholo Atoll }	9 30	5	
Naafe River (entrance) - }	10 0			Laccadives, Cherbaniani Reef - }	10 0	7	4
Cheduba Island -	11 30	8		Tamareed, Socotra Keeling Islands } (Port Refuge) -	7 20	8	
Diamond Island -	10 30	8		Christmas Id. -	5 30	5	
Chittagong (Bar) -	1 15	15	10	Nicobar Islands, Nancowry Harbour - }	10 0		
Islands in Indian Ocean.				Andaman Islands, Port Blair }	9 15	8½	
Kerguelen (Christmas Harbour) - }	2 0	2		„ Port Cornwallis - }	10 0	9	6
St. Paul Island -	11 0	3		„ Andaman Strait }	10 0	8½	
Amsterdam Id. -	11 0	3			10 24	9½	
Mauritius, Port Louis - }	12 30	3	2½				
„ Grand Port - }	1 0	1½					
Reunion or Bourbon Island, (St. Pierre) }	Noon	3½					
„ (St. Denis) -	0 22	2½					
„ (St. Gilles) -	1 0	2½					
„ (St. Paul) -	1 7	4					
Rodrigue Island -	1 45	6					
Cargados Garayos Shoals - }	2 0	4					
Chagos Archipelago, (Diego Garcia) - }	1 30	6					
Seychelle Archipelago, (Mayhé Island) - }	4 0	6½					
Curieuse Island -	5 10	7					
Peros Banhos -	1 30	5					
Amirauté Isles, (St. Joseph I.) }	5 0	8½					
Comoro Islands, (Maroni Bay, Comoro) - }	4 53	10					
„ (Douany, Mohilla) - }	4 0	11-12					
				Malacca Strait, Malay Coast.			
				Junkseylon Island } (East side) -	10 0	11½	
				Queda -	12 0	5½	
				Penang (Georgetown) - }	12 0	9	7½
				Lt. Vessel (One Fathom Bank) }	6 0	15	12
				Arroa -		10	
				Cape Rachada -	5 30	13	
				Sambilangs -		12	10½
				Malacca Road -	7 30	11	8½
				Off Mount Formosa -	8 0	11	8½
				Tanjong Bolus -	9 30	10½	8½
				North Sands -	5 30	15	12½
				Singapore, New Harbour - }	9 45	10	7½
				Rhio -	10 0	7	5

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Malacca Strait, Sumatra Coast.</i>				<i>Durian Strait.</i>			
	h. m.	ft.	ft.		h. m.	ft.	ft.
Point -	12 0	9½		Sabon Island -		10	
ver (en- }	9 0	12		Deep Point -	5 0	10	
he town -		11		Red Island -	5 0	10½	
<i>Timor, East End.</i>				<i>Banka Strait.</i>			
-	11 0	9	6½	Toboe Ali Point -	8 30 P.M. † 10 0 A.M. ‡	12	
<i>Sumba or Sandelhout, North Coast.</i>				Lucipara Pass -	irr.	10	7½
erie Har- }	11 30	17	13½	Nangka Island -	7 0	9½	
Road -		15		Cape Oelar -	6 30	12	
<i>Sumbawa.</i>				Bersiap Point -	6 30	12	
land -	8 10	3		Kalian Point -	8 17†	15½	
y -	1 0	10		Lobah Point -	11 0†	10	
Bay -	1 0	11-12		<i>Gaspar Strait.</i>			
y -	Noon	6		Pulo Mendanao -	2 30	4	
<i>Lombok, West Coast.</i>				Pulo Leat -	2 30	4	
n Bay -	8 0	6		<i>Java Sea.</i>			
ty -		10-12		Crimon Islands -	8 0	6	5
<i>Baly.</i>				<i>Celebes.</i>			
Bay } -	11 0	9½		Macassar -	4 40	5½	
Coast) -				<i>Flores Sea.</i>			
Road } -	5 0	6½		Adenara, Flores -		8	
Coast) -				<i>Moluccas.</i>			
<i>Java.</i>				Batchian, Gilolo -	1 0	6	
Bay -		7-8		Sanguir Island -		6	
Harb. } -	8 45	3½		Gèby, Fohou Island -		5	
Coast) -				Wahauy Harbour, } -	6 0	3	
Bay } -	5 0	5½	4	Ceram -			
Coast) -		5		Bouro, Cajeli Bay -	1 0	6	
-	10 0	2		Amboyna -	0 32	7	
-	7 0	4		Saparoua Island -		6	
<i>Sumatra, N.E. Coast.</i>				Cambing or Pas- } -	noon	6	
-		5		age Island -			
-	6 0	6		Banda, Banda Islands -	4 0	6 ?	
Linga } -	6 0 P.M.	12		Dampier Strait -		11	
er -	4 0	8		<i>Filipinas.</i>			
<i>Sumatra, West Coast.</i>				Port Zebu -	12 0	7	
-	6 0	3-5		Port Bulnagan -	12 0	5½	
iver (Bar) } -	6 0	4½		O'ata Ana -			
Island } -	6 0	4		Port Iliolo -	12 0	5½	
id) -				Port San Jacinto, } -	6 30	6	
ly Har- }	6 10	6		Ticao Island -			
end -	8 45	8		Mindanao -	7 0	6	
				Manila (Luzon) -	10 40	2½	
				Port Sual -		6	
				Port Lagnimanoc -	1 30	5½	
				Alabat Harbour -	10 0	9	
				Paloan Bay (Min- } -		5	
				doro) -			
				Busuanga (Burias Id.) -	12 30	6	

observations made in the month of September by W. Stanton, Master commanding H.M. Surveying Brig, Saracen.

† In S.E. Monsoon.

‡ In N.W. Monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Loo Choo Islands.</i>							
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>
Nafa-Kiang -	6 28	7		Ursula Island			
Port Oonting -	6 35	8		(Palawan, East Coast) -	11 0	7½	
Oho Sima, Vincennes Bay -	7 30	5½		Port Royalist -	11 0?	6½?	
<i>Bonin Islands.</i>				Millman Island			
				(Palawan, West Coast) -	10 27	3½	
Port Lloyd, Peel Island -	6 8	3		Casuarina Point, -	9 30	6½	
New Port, Hillsborough Id. -	11 32	3½		Barren Island -	9 30	5½	
<i>China Sea, East Coast.</i>				Millman -	9 30	6	
				Tai-Tai Bay -	9 30	5½	
St. Pierre, Island -		4		Batanes, Bashee Islands -		4	
Rendezvous Island, Borneo, S.W. Coast -		8		Port Kok-si-kon (Formosa, East Coast) -	11 30	3	
Tanjong Api -		7		Tam-Sui Harbour -	11 45	7-12	
Sarawak River (Moratabas entrance) -	4 0	9	5½	Kelung Harbour (Formosa, N. Coast) -	10 30	3	
" Santubong -	4 0	10	6	Sau-o Bay -	10 0	3½	
" Sarawak Junction -	5 0	15-18	9	<i>Babuyan Islands.</i>			
" City -	5 20	15-18	9	Port Pio Quinto, Camiguin Island -	6 0	8	
Burong Island -	4 45	7		Port Musa, Fuga or New Babuyan -		5	
Rajang River -	4 45	18	9	<i>China Sea, West Coast.</i>			
Bruit River -	3 0	11					
Bintula River -	5 45	6		Romania Point, (Malay Peninsula, E. Coast) -	10 30		
Labuan Island -	9 45	6		Sedili River (entrance) -	9 44	7	
Mungalum Island -	11 0	5		Blair Harbour -	8 50	9	
Bruni River -	11 0	12		Pulo Timooan (West side) -	6 0	7½	
Dalawan Bay (Balabac Island) -	11 0	5		Binkang Bay (Cochin China) -	11 30	5	
Malludu Bay, Borneo N. Coast -	10 30	6-8		Tringano River (Gulf of Siam, West Coast) -	8 0	8	
Balamangan Id. -	10 0	6-8?		Menam River, Paknam -	5 7	9½	
Unsang (Borneo, N.E. Coast) -	8 0	3½		Cape Liant (Gulf of Siam, E. Coast) -	5 7	6½	
Ragged Point, Borneo, E. Coast -		7		Chentabun River (entrance) -	10 0	5½	
Famarung Islands (Borneo East Coast) -		8-10		Rocky Island (Gulf of Siam, E. Coast) -	4 0	4	
Eran Bay (Palawan, West Coast) -	10 10	6½		Pulo Panjang -	7 0	2	
Tay-bay-oo-bay -	10 15	6		Pulo Condore (Cochin China)* -	2 30	6½	
Ooloogan Bay -	9 30	5½		Saigon, Cochin China, Cape St. James -	11 0	8	
Mayday Bay -	9 55	3½		" Saigon City -	5 30	9½	
Port Barton (Bubon Point) -	10 55	6					
Pamal -	9 40	6					
Bacuit Bay -	10 0	6					
Cavern Island -	9 30	5½					
Observatory Island -	11 0	5½					

* From a French Survey, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full, and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
g Bay				Amoy, Inner Harb.	12 0	18½	14½
in China, }	8 30	5½		Hu-i-tau Bay -	12 15	16	
ast - }				Chimmo Bay -	10 20	16	
ne Bay „	11 30	5		Chincnu Harbour -	12 25	17	
Bay „	3 0	4		Meichen Sound -	12 30	17	
Bay }				Hai Tau Strait -	12 15?	16?	
in Island, }		4-5		White Dog Ids. -	9 0	18	
k Harbour }	12 0	8½		Min River, Tem- }	10 45	19	14½
, E. Coast) }				ple Point - }			
Shoal -	4 0	5		Min R., Losing Id.	12 0		
River }	10 0	8		Chang-chi Island -	9 30	17	
(nce) - }				Spider Island -	10 0	17	
ay River }	11 0	7½		Lishan Bay -	10 15	16	
(nce) - }				Namquan Harbour	10 0	17	
nchorage -	10 0	7		Namki Islands -	8 30	17	
-	10 0	6½		Pih-ki-shan Ids. -	8 30	17	
ymun Har- }	12 6	6½		Fong-whang- }			
Canton R. }				group, Bullock }	8 30	17	
et entr. „	11 50	6½		Harbour - }			
Channel „	1 30	6½		Wan-chu River (ent.)	9 0	15½	
Id. „	11 20	6½		„ City	9 30	15½	
d. „	12 0	7½		Towan Island -	9 20	13	
k Channel „	1 0	7½	5	Tai-chow Islands -	9 0	14	
ee Point „	2 0	7½		St. George Id. }	10 20	15	
Mar. -	1 40			San-moon Bay }			
April -	1 15	7-8		Kweshan Islands -	9 30	14	
May & }	0 30			Nimrod Sound -	10 30	20	
June - }				Vernon Channel, }			
Mar. -	2 40	5½		Chusan Archi- }	9 40	14	
May & }	1 40	5½		pelago - }			
June - }				Ting-hae Harbour	11 0	12	9
Si Kiang }		5-6		Poo-too Island .	8 15	12	
est River. }				Lansew Bay -	10 0	13	
ng „ -		3		Volcano Islands -	11 30	15	
„ -		1-1½		East Saddle Island	11 0	14	
ong Road -	10 15	4½		Yung River, Chinhae	11 20	12½	
Group -	10 0	5		„ Ning- }			
ve, Mirs Bay	10 0	6½		po-fu }	1 0	9	
ng Id. Bias }	8 0			Hang-chu Bay, }			
- }				Sesham Ids. - }	11 45	14	
how Id. }	8 30			„ Fog }	11 45	17	
Bay - }				Islands }			
ai Bay -	10 0	6½		„ Chapu }	12 0	25	
ng Point, }	7 0			Road }			
echin Bay }				Hang-chu Bay }		32	
Point -	8 0			(off Can-pu) - }			
n Bay -	9 0	7?		Gutzlaff Island -	11 30	15	
Good Hope	9 0	7?		Yang-tse Kiang }	12 0	15	10
Road, Na- }	11 15	7		(entrance) - }			
Id. - }				„ entrance }			
Bay .	11 0	6½		to Wusung }	0 30	15	10½
ng Harbour	11 30	12		River - }			
y Id. Rees }	11 30	12		Pheasant Point, }	0 35	13	8
- }				Wusung River }			
Harbour }	10 30	9½	7	Shanghai - -	0 40	10	7
adores) - }				Langshan Crossing	1 40	12	8

Amoy Docks—In March, the day and night tides rise to the same level. From April to October day tides are the higher, and from November to February the lower. In May and June the level, during tides is 4 feet, and the neaps 2 feet higher than in March.

Langshan Crossing the tide rises for 3 hours only, and falls for 9 hours.—H.M.S. Actæon, 1861.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Yellow Sea.				Japan Sea.			
	h. m.	ft.	ft.		h. m.	ft.	ft.
Wang-kia-tai Bay	6 0	12	9	Korea, S. Coast, }	8 58	11½	6½
Ching-tau Bay	6 0	12	9	Tracy Island - }	9 10	11½	8½
Lo-shan-kan	4 30	11	9	" Hooper Id. -	8 30	11	
Staunton Island	1 30	8	5½	" Port Hamilton			
Wang-kia Bay	2 30	9	7	Japan Sea.			
Shihtau Bay	1 30	9	7	Yung-hing Bay	5 20	2½	
Sang-tau Bay	0 55	7	4½	Tsau-llang-hai or			
Aylen Bay	2 30	6	4	Chosau Harbour	7 45	7	5
Litau Bay	3 0	6	4	(Korea) -			
Wei-hai-wei Har-	9 30	9		Nagasaki Bay	7 15	9	7½
bour				(Nipon, S. C.) -			
Lung-mun Harbour	10 0	7		Tama no Ura		6-8	4-6
Chifu	10 34	8	6½	Harb., Goto Id.			
Hope Sound (Mi-	10 24	6½		Iki		8	
au-tau Group)				Tsu sima Sound	8 30	8	6
Miau-tau (Depôt	10 35	6		Simonoseki	8 30	8	
Bay)				Sado Yebisu)	5 0	2	
Ta-tsing ho	4 10	10½	8	Tsugar Strait	5 0	5	
Peiho or Peking	3 40	11	7½	Hakodadi Har-	5 0	11	
River (entr.)*				bour, Yezo Id.			
Tien-tsin, Peiho	7 0	4½		Endermo Har-	5 30	6	
River				bour, Yezo Id.			
Peh-tang ho	3 33	10	7½	La Perouse Strait	10 30	6	
Sha-lui-tien Banks	2 50	10	8	Yoku-hama, Yedo			
(west part)				Bay	6 0	6½	4
Liau-tung, Ching	1 20	6½		Tatsumi Bay	5 50	5	
ho				Fatsizio	6 0	5	
Lau-mu ho	1 30	5		Port Simoda	5 0	3-5	
Tai-cho ho	0 15	6		Heda Bay		6½	
Yang ho	0 15	6		Enora Bay		4	
Ning-hai	12 0	6		Simidzu	7 30	7	
Sand Point, Gulf	4 50	7	5½	Urakami	7 30	6	5
of Liau-tung)				Oosima	6 50	5	
N W. Head of Gulf	5 30	10	8½	Tanabé Ki Channel	6 0	11	5½
of Liau-tung				Uranouchi		5	
Liau Ho (Bar)	4 0	11½	7½	Osaki	5 55	6½	
" (entrance)	5 0	12		Hata	6 4	6½	
Vansittarts Saddle	4 20	10	8½	Yura Harbour	6 5	6½	
Hulu Shan Bay	2 30	8	6	Naruto (Fukura)	6 17	7	
Society Bay, Suli-	0 15	11		Akasi	6 36	6½?	
van Bay				Awajima (Inland	0 14	7	
Port Adams, Mary	2 0	10		Sea)			
Island				Tomo (Seto-uchi)	11 0?		5
Pigeon Bay	11 45	11		Gulf of Tartary.			
Ta-lien-whan Bay	10 47	10½	8	St. Vladimir Bay	irr.	3	
Encounter Rock	10 44	11	8	Napoleon Road	2 30	2½	
Haiyun-tau	9 30	12	8	(West Coast) -			
(Thornton Haven)				Port Michael Sey-	5 30	3	
Chodo Id., Korea,	6 20	12		mour			
W.C.)				Barracouta Har-	10 0	3½	
Basil Bay	4 15	18	10	bour			
Marjoribanks	3 30	29		Castries Bay	10 30	11	
Harbour				Jonquiere Bay	10 0	6	
Ko-kun-to Group,	2 25	18	10	(East Coast) -			
Korea, S. Coast,	9 28	11½	8½	Amur Strait	11 40	5-6	
Kuper Harb. -				Cape Maria (Sag-			
" Crichton Harb.	9 50	11½	8½	halin Id.) Sea	2 0	5	
				of Okhotsk			

* Time and rise much affected by winds.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Kamchatka.</i>							
Bay	h. m. 3 30	ft. 6½	ft. 4½	New Plymouth (Taranaki)	h. m. 9 30	ft. 12	ft. 9
<i>Zealand:—South or Stewart Island.</i>				Kawhia Harbour	9 30	12	
Bay	11 10	8	6	Aotea Harbour	10 0	12	9½
Pe	12 0	7	5	Waikato River	9 30	12	9
Gasus	11 50	8	6	Manukau Harbour (entrance)	9 30	13	10
Venture	12 20	8	6	Kaipara Harbour (entrance)	10 55	10	8
Is Inlet	1 10	8	6	Hokianga River (entrance)	9 45	0	
Liam	12 45	8	6	„ (Kokohu)	10 15	10	7
<i>Middle Island, East and North Coasts.</i>				Cape Maria Van Diemen	8 0	7	
Harbour	1 18	8	6	Three Kings Islands	8 0	7	
ix Bay	3 0	8	6	<i>North Island, East Coast.</i>			
Harbour (entrance)	2 50	7	5	Cape Palliser	6 0	6	
Harbour	3 24	8	6	Hawke Bay	7 50	3	
oper	3 50	7½	5½	Poverty Bay	6 5	6	
Peninsula	5 30	8	6	East Cape	8 55	7	
mpbell	6 0	8	6	Hicks Bay	9 0	7	
derwood	6 10	8	6	Tauranga Harbour	7 10	6	4½
Charlotte (entrance)	8 50	8	6	Mercury Bay	7 21	7	5
re	9 0	8	6	Gt. Barrier Island (Nagle Cove)	6 25	10	7
Sound (entrance)	9 35	11	7	Auckland Harbour	7 5	11	9
rdy	9 55	8	6	Kawau Island	6 30	10	7
es Harbour	9 0	12	8	Wangari Harbour	7 0	9	7
	9 50	14	10	Tutukaka Harbour	7 0	9	7
e Bay.	8 45	13	9	Wangaruru Harbour	7 10	9	7
an Corner				Bay of Islands, (Motu Mea Islet)	7 15	9	6
Motu Pipi	9 50	14	10	Wangaroa Harbour	8 15	7	
, W. Ent.				Cavalli Islands	8 0	7	
rewell	9 20	14	10	Monganui Harbour	8 15	9	7
<i>Middle Island, South and West Coasts.</i>				Awanni River	7 44	7	
e Id. (Fo- St.)	1 0	8	6	Parenga-renga Harbour	7 54	7	
Id. (Fo- St.)	12 15	8	6	<i>Australia, East Coast.</i>			
ation Inlet	11 20	8	6	Twofold Bay	10 0	7	5
Inlet	11 5	8	6	Botany Bay	8 15	7 – 8	
Bay	11 15	10	8	Jervis Bay	6 20	6 – 9	
ound	11 30	8	6	Port Jackson, North Head	8 15		
on Sound	11 30	8	6	Sydney	8 38	4½	4
ound	10 45	8	6	Broken Bay	8 0	6 – 9	
Sound	9 15	8	6	Newcastle or Port Hunter	9 45	6 – 7	
ui Inlet	11 20	7	6	Port Stephen	9 0	6	
<i>North Island, South and West Coasts.</i>				Manning River	9 15	4	
Cholson, Harbour	4 30	5	3	Crowdy Head	9 15	5	
land	7 0	8	6	Port Macquarie	8 56	4 – 5	
land	9 0	6		Shoal Bay	8 30		
Motu River	10 0	8	6	Richmond River	9 20		
ui River	10 15	8	6				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Cape Byron -	9 45	6		Possession Island -	1 0	9½	
Tweed River } (Danger Point) }	9 45	5 - 8		Darnley Island -	9 30	12	
Moreton Bay -	9 30	3 - 7		Bramble Cay -	9 15	12	
Wide Bay -	9 14	10	7	Murray Islands -	9 30	10	
Sandy Cape -	7 50	6 - 8		Adolphus Island -	12 15	10	
Port Curtis -	9 40	10 - 12		Albany Islands } (Port Albany) }	12 15	10	;
Byron Bay -	9 45	6		<i>Australia, North Coast.</i>			
Wreck Reef, } (Bird Islet) - }	8 3	6		Endeavour Strait, } E. Entrance - }	1 0	9½	
Cato Bank -	8 0	6		Booby Island -	4 30	8	
Lady Elliot Islet -	9 0	7 - 8		Albert River (Kangaroo Point) - }	7 30	10 - 13	
Heron Islet, } Capricorn Group }	9 0	10		Wellesley Isles -	7 30	8 - 12	
Keppel Bay -	9 30	9 - 14		Sir E. Pellew Isds. -	7 30	4 - 7	
Great Barrier Reef -	8 48	7		Investigator Road -	8 0	9	
Saumarez Reef -	8 0	6		Arnhem Bay -	8 0	6 - 8	
Frederick Reef -	8 0	6		Goulburn Isles -	6 0		
Kenn Reef -	8 0	5½		Alligator River -	8 40	19 - 20	
Middle Bellona Reefs -	8 30	6		Shoal Bay -	6 0	18 - 25	14 - 20
Avon Isles -	8 30	5		Port Essington -	3 24	13	
Chesterfield Islet -	8 30	5		St. Asaph Bay -	5 45	14	
Mellish Reef (Sand Cay) - }	7 55	5 - 6		Swift Bay -	12 0	21	
Thirsty Sound -	10 45	12 - 18		Port Darwin -	5 30	17 - 24	
Port Bowen -	9 35	16		<i>Australia, North West Coast.</i>			
Shoal Water Bay -	10 30	12 - 18		Victoria River, } Turtle Point - }	7 15	15 - 24	
Broad Sound -	11 0	20 - 30		„ Mosquito Flat -	0 19	7 - 13	
Swain Reefs -	10 25	10		„ Sandy Island -	1 17	3 - 10	
Percy Isles, Middle } or No. 2 Island }	10 30	16	13	Prince Frederick } Harbour - }	12 0	28	
(West Bay) -				St. George Basin -	12 15	25	
„ South or } No. 1 Islet, }	10 30	14		Careening Bay -	11 45	30	
(N.W. Bay) - }				Admiralty Gulf -	12 0		
West Hill -	10 20	24		Brunswick Bay -	12 0	24	
Cape Conway -	11 0	18		Camden Harbour -	12 0	37½	
Goold Island -	6 45	6		Collier Bay -	11 45	36	
Port Denison -	9 30	6		Sharks Bay, Natu- } raliste Channel }	11 45	6	
Upstart Bay -	9 0	6		„ Denham Sound -	12 5	5	
Cleveland Bay -	7 30	10 - 12		„ Freycinet Reach -	3 0	5	
Dunk Island -	9 28	6 - 10		„ „ Estuary -	4 15	3½	
Fitz-Roy Island -	9 15	7 - 12		„ Cape Perron -	12 45	5½	
Endeavour River -	8 0	5 - 10		„ Hamelin Pool -	5 0	3½	
Trinity Opening, } Great Barrier } Reefs - }	9 15	7 - 12		Houtman Rocks -	11 30	2½	
Lizard Island -	9 15	7 - 10		Champion Bay -	9 10	1	
Willis Islets -	8 0	6		<i>Australia, West Coast.</i>			
Osprey Reef -	8 36	6		Cockburn Sound -	9 0	1 - 1½	
Flinders Group -	9 15	8 - 12		Warnboro' Sound -		3 - 4	
Cape Sidmouth -	9 15	10		Koombanah Bay -	9 0	½ - 3	
Cape York -	11 15	10	7	Port Grey, Swan } River - }	9 0	1 - 1½	
<i>Torres Strait.</i>							
Sir Cs. Hardy Is. -	9 15	10					
Raine Island -	8 10	10					
Wallis Island -	Irreg.	7					
Cape Possession -	9 0	6					

	High Water, Full and Change.	Rise.		Place.	High Water, Full and Charge.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
<i>Australia, South Coast.</i>							
	h. m.	ft.	ft.	Tamar River, } (Launceston) -	h. m.	ft.	ft.
-	11 40	8		Eddystone Point -	1 0	12½	
story	2 0	10		Georges Bay -	9 39	7	
-	1 10	■	6	Cape Pillar -	9 42	3	2
ance	1 30	3-4		Port Arthur -	1 0	6	
cliff	1 30	3		Hobarton -	7 52	4	
Bay	2 30	3-4		Macquarie Harb. -	8 15	4½	3½
Bay	3 0	3-4			7 30	3	
-	1 20	3					
-		4					
ur	2 50	2½		<i>Islands in South Pacific.</i>			
-		4		Easter Island -	2 0		
-	Midnight	4		Bow Island -	2 40	3	
r	3 0	5		Tabuai Id. -		3	
-	10 0	4		Tahiti or Otaheite Id. -	noon	1½	
-		5-6		Resolution Bay, Sta. Christina, Marquesas -	2 30	4	
oals	3 30	6		Fanning Id. -		4	
-	5 44	■		Tongatabu -	6 50	4	
by, }	4 10	■		Port Resolution, Tanna Island -	5 35	3	
- }				Port Aneiteum, Inyang -	6 35	4	
on, }	5 0	6		Banks Ids., Port Patteson, Vanu -	6 40	5	
- }				Lava Id. -			
sage	12 0	6-8		" Port Sandwich, Malicolo Id. -	5 30	4	
-	5 45	4½		" Vita Harbour, Sandwich Id. -	5 0	■	
y	7 0	6-8		" Havannah Harb. Sandwich Id. -	7 15	4	
ta*	8 30	9-12		" Dillon Bay, Erromango Id. -	5 30	4	
-	irr.	4-5		Solomon Islands -	6 45	2	
is	1 50	3		Erronau or Futuna -	7 24	4	
-	10 30	6		Sandalwood Bay -	6 0	6?	
ale, }	12 0	6		Fiji Islands -			
- }				Port Nukulan or Rewa Road, Fiji Id. -	6 47	5½	
- }	1 0	5		Balade Harbour, New Caledonia -	6 30	4?	
-	12 15	■		Port Vao, Isle of Pines, New Caledonia -	8 6	4	
-	12 15	6		Prony Bay, New Caledonia -			
-	10 30	6		Port de France, New Caledonia -	8 25	4	
r	2 15	6		Port St. Vincent, New Caledonia -	5 50	4½	
we	9 0	6		Woodlark Island -	7 15	4	
yal }	11 56	1-4		Louisiade Archip. -			
- }				Port Carteret, New Ireland -		■	
<i>Bass Strait.</i>							
-	12 5						
-	1 0						
-	11 30	8					
ock }	10 30	10					
le- }	9 35	6					
s	12 20						
-	11 10						
-	11 10	■					
<i>Tasmania.</i>							
-	11 40	9					
ort }	12 5	10	7½				
n) }							

Augusta, when the wind veers round to West and South and blows strong, the rise has as much as 16 feet. Commander John Hutchison, R.N., Admiralty Survey, South Africa, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.	<i>Tierra del Fuego, S.W. Coast.</i>			
Lord Howe Island	8 30	6		Cape Horn	4 40	9	
Norfolk Island	7 45	7		St. Francis Bay	4 0		
Campbell Island	12 0	5		St. Martin Cove	3 50	8	
Raoul or Sunday Id.	6 0	5		Middle Cove	3 30		
<i>Islands in North Pacific.</i>				Goree Road	4 0	8	
Karakoa Bay,	3 49			Lennox Cove	4 40	9	
Owyhee				Nassau Bay	4 0	6	
Honoruru, Sand-	4 0	2		Good Success Bay	4 3		
wich Islands				Packsaddle Bay	3 30	6	
Pouinipet Island,	6 0	4½		Orange Bay	3 30	5	
Caroline Islands				New-year Sound	3 30		
Seypan Island,	6 45	2½		Adventure Cove	3 10	4	
(Ladrone Ids.)				March Harbour	3 10	6	
Pelew Islands		6		Doris Cove	3 0	4	
<i>South America, Strait of Magellan.</i>				Stewart Harbour	2 50	4	
Cape Virgin	8 30	36 - 42		Townshend Harbour	2 30	5	
Cape Espiritu Santo	8 30	36 - 42		Fury Harbour	2 30	4	
Possession Bay	9 0	36 - 42		North Cove, Fury	2 30	4	
Cape Orange	3 0			Island			
First Narrows	9 0	36 - 42		Hewett Bay	0 30	6½	
Philip Bay, east side	9 30			Bedford Bay	0 30	7½	
Gregory Bay	9 45	23		Smyth Harbour	12 0	6½	
Second Narrows	10 0	23		Noir Island	2 30	5	
Peckett Harbour	12 0			Laura Harbour	1 0	6	
Laredo Bay	11 30	9		Cape Castlereagh	2 50	4	
Santa Magdalena	12 0	10		Cape Gloucester	1 30	5	
Island				Cape Inman	2 0	4	
Port Famine	12 0			Latitude Bay	2 5	4	
Cape San Isidro	1 0	8		Week Islands	2 0	5	
St. Nicolas Bay	2 6			Dislocation Harbour	1 40	4	
Cape Froward	1 0			Diego Ramirez	4 0	6	
Port San Antonio	12 0	7		Islands			
Labyrinth Islands	0 30	5½		<i>Patagonia, West Coast.</i>			
Port Gallant	9 0	5½		Evangelists	1 0	5	
York Road,	2 0	9		Port Henry	12 0	5	
English Reach				" Barbara	12 28	4	
Bachelor River	1 40	5		San Tadeo River	11 45	6	
Borja Bay	1 50	6½		Port San Domingo	12 0	7	
Playa Parda Cove	1 8			Piti-Palena	12 23	10	
Port Tamar	3 5			Tictoc Bay	1 45	11	
Valentine Harbour	2 0			<i>Chonos Archipelago.</i>			
Harbour of Mercy	1 22	4		Port Otway	11 37	6	
Cape Pillar	1 0			San Andres Bay	0 45	5	
<i>Smyth, Sarmiento, Wide, and Messier Channels.</i>				Port San Estevan	0 15	8	
Goods Bay	0 30	7		Anna Pink Bay	0 45	5	
Fortune Bay	0 50	7		Vallenar Road	0 18	5	
Welcome Bay	0 50	7½		Port Low	0 40	7	
Puerto Bueno	1 40	8½		<i>Chiloe Archipelago.</i>			
Guia Narrows	2 10	8		Huafu Island	12 0	7	
Fury Cove	1 15			Cucuo Bay	12 0	6	
Eden Harbour	12 30	5		Port San Carlos,	11 15	6	
Halt Bay	0 30	8		Town			
Middle Island	12 0						

e.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	<i>h. m.</i>	<i>ft.</i>	<i>ft.</i>		<i>Peru.</i>		
Carlos } las } English } - } - } lock - Passage let - ve - nd - d - Harbour - - Islands - off - ve - d - et - nd - Head - Inlet - land - ort - each - nd - s Point- y - rows -	0 14 0 4 0 50 0 50 0 30 0 48 0 28 1 3 0 31 0 54 0 11 0 26 0 35 0 57 0 55 0 29 1 10 1 25 0 44 1 5 1 18 or 0 47 1 15 0 50 1 15 0 40 1 15	6 10 16 9 16-20 15½ 11 18 18 20 20 17 20 15½ 14 11 16 16 11 10	13½	Iquique Road Lobo Point Arica Road Ylo Road Islay Quilca River Point Lomas Atico Road Port San Juan " San Nicholas Yndependencia Bay Pisco Bay Callao Bay Huacho Bay Supé Bay Guarmey Bay Samanco or Guambacho Bay Port Malabrigo Lambayeque Road Port Payta Malpelo Point	h. m. 8 45 8 0 8 0 8 15 8 53 8 0 8 19 8 53 5 10 5 15 4 50 4 50 5 47 4 45 4 50 6 10 6 30 5 0 4 0 3 20 4 0	ft. 5 5 6 7 6 5 5 3 3 2 2 2 3 3 3 3 2 2 3 3 3 3	ft. 11 11 11 11 8 12 6 10 10 13 13 12 9
	<i>Chile.</i>				<i>Ecuador.</i>		
iver - via - nd - er - ia Island y - o - er - t - rlandes } - } ie Bay - adura - Bay - co - - enco - y - int - - Bolivia.	0 52 10 35 10 30 10 30 10 20 10 15 10 14 10 0 9 45 9 32 9 30 9 20 9 8 9 8 8 30 8 30 9 10 9 20 9 45 9 40	21 5 5 6 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	4	Sta. Clara Island Morro, Sandy Point of Puna Island Guayaquil St. Elena Bay Salango Id. Port Manta Caracas River Cape Pasado Atacames Bay Santiago River Tumaca Road Sanguilanga (en- trance) Galapagos Islands. Charles Island Albemarle " Chatham " Indefatigable " James, I., West-end " N. side " Adam Cove Tower Id. Culpepper Id. Wenman Isles New Granada and Veragua. Port Buenaventura (Negrilla Reef) " off the Town San Juan River Cabita Bay Port Utria	4 0 5 0 6 0 7 0 1 18 0 41 3 4 3 30 3 30 3 37 3 30 2 33 4 10 2 10 2 0 2 23 1 56 3 10 2 34 2 14 ? ? 2 10 4 0 6 0 6 0 3 40 4 0	ft. 11 11 11 11 8 12 6 10 10 13 13 12 9 6 6½ 6 5 5 5 ? ? 5 13 11 12 12 12	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Cupica Bay -	3 30	13		Columbia River, }	0 15	7½	
Octavia Bay -	3 30	13		Entrance - }			
Pinas Bay -	3 15	14		Astoria* -	0 42	7½	6
Chepo River -	3 40	16		Nee-ah Harbour* -	12 33	7½	6½
Pedro Gonzales, }				Port Townshend* -	3 49	5½	5
(Trapichi Id.) - }	3 50	16		Fort Steilacoom* -	4 46	11	9½
Chamé Bay -	4 0	16					
Saboga -	4 0	14		<i>Vancouver Island, Juan de Fuca Strait, and</i>			
Panama Road -	3 23	15 - 22	10 - 16	<i>British Columbia.</i>			
Port Nuevo -	3 10	12		Esquimalt Harb.† -	irr.	7 - 10	5-8
Parida Island -	3 15	10½		Victoria Harbour†	irr.	7 - 10	5-8
<i>Central America, West Coast.</i>				Inner Channels }			
Nicoya Gulf (Port Herradura)	3 9	10		leading from }	irr.	10 - 12	
Port San Juan del Sur }	3 8?	10?		Juan de Fuca }			
Port Realejo -	3 6	11		Strt. to Haro St. }			
Port la Union, }	3 15	10½	8½	Port Discovery -	2 30	7	
G. of Fonseca - }				Nisqually, Puget }	6 0	18	15
Acajutla Road -	2 25	9		Sound - }			
				Fane Id., Plum-	irr.	12	
				per Sound - }			
				Drayton Harb., }	2 0	12	
				Semiahmoo Bay }	6 30	7 - 10	
				Fraser River (entr.)			
				Burrard Inlet, }	6 0	16	
				G. of Georgia - }			
				Plumper Cove, }	noon.	12	
				Howe Sound† }	noon.	12	
				Port Graves† -			
				Nanaimo Harbour }	5 0	14	
				G. of Georgia - }			
				Nanoose Harbour, }	5 0	15	
				Vancouver Id. }			
				Pender Harbour, }	6 0	13	
				Strt. of Georgia† }			
				Hernando Island, }	6 0	13	
				Strt. of Georgia }			
				Waddington Harb., }	6 0	13	
				Bute Inlet - }			
				Gowlland Harb., }	5 30	11	
				Discovery Pas-			
				sage - }			
				Cameleon Harb., }	3 0	16	11½
				Nodales Channel }	3 0	16	11½
				Forward Harb., -			
				Beaver Creek, }	3 0	16	11½
				Loughborough }			
				Inlet - }			
				Topaze Harbour -	3 0	16	11½
				Knox Bay -	12 0	16	
				Port Neville -	0 30	17	
				Port Harvey§ }	0 30	10	
				(Call Creek) - }			
				Beaver Cove -		15	
				Alert Bay, Cor-		15	
				morant Id. - }			
				Beaver Harbour§ -	0 30	15½	
				Shucartie Bay† -		12	
				Bull Harbour, }	0 30	12½	
				Goletas Channel† }			

* From the U.S. Survey, the times of High Water being the Corrected and not the Vulgar Establishment.

† May to October, from Midnight to 3 a. m. November to April from Noon to 3 p. m.

‡ From observations made in the month of October.

§ From observations made in May.

Place.	High Water, Full and Change.	Range.		Place.	High Water, Full and Change.	Range.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.				
San and Tra- Harbours, } San Charlotte nd }	12 0	16	11½	<i>America, North West Coast.</i>			
San Harbour, } San Passage }	12 0	16	11½	Port Kuper -	h. m.	ft.	ft.
San Harbour, } Sound - }	12 0	16	11½	Portland Inlet, } (Salmon Cove) }	1 8	16	10½
San Harb. " -	12 0	16	11½	Sitka* -	0 34	5-7	
San Sound, }	11 0	11		Behring Bay -	0 30	9	
San Id. }	12 0	12		Port Etches -	1 15	9½	
San Inlet " -	12 0	12		" Chalmers -	1 0	13½	
San Inlet " -	12 0	12		" Chatham -	1 0	12	
San-Kinsh }	12 0	12		Ounalashka Island	7 30	7½	
San " }	12 0	12		Cape Roshnoff -	7 30	15	
San Id. " -	12 0	12		Good-news Bay -	6 15	13½	
San Inlet " -	12 0	12		Golovnin Bay -	6 23	3½	
San Sound " -	12 0	12		Port Clarence -	4 25		
San Harb. " -	12 0	12		Chamisso Island -	4 42		
San Sound, }	12 0	12					
San Harbour }	12 0	12					
San Sound -	12 0	12					

The rise at Sitka as given by Commander Pearce, H.M.S. Alert, in his remarks in 1860, does not
7 feet, but on the authority of Commander Pike, H.M.S. Devastation (1862), the local pilots
at the rise sometimes is as much as 16 feet.

T I M E
OF
HIGH WATER ON FULL AND CHANGE DAYS
AT THE PLACES GIVEN IN THE PRECEDING PAGES;
ARRANGED ALPHABETICALLY;
*With the Rise of the Tide at Springs and Neaps.**

(When a query, thus?, is placed after the Time of High Water and the Rise, it indicates that what is given are approximations.)

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	b. m.	ft.	ft.		b. m.	ft.	ft.
Abaco, Bahamas - -	8 0	3		Agoada Pnt., Hindoostan, W. Coast.	10 30	9	
Abbey Head, England -	11 10	23	17½	Agulhas Cape, Africa, S. Coast.	2 50	5	
Abd-ul Kuri, Indian Ocean	8 30	6		Air Point, River Dee, England.	10 54	25	19
Aberdeen, Scotland - -	1 0	12	10	Aix, Ile d', Charente R., France.	3 20	17	12½
Aberdovey, Wales - -	8 0	15		Akaroa Harb., New Zea- land.	3 24	8	6
Abervrach, France - -	4 14	22	16	Akasi, Japan Sea -	6 36	6½?	
Aberystwyth, Wales -	7 31	13½	10	Akyab, Aracan R., Bay of Bengal.	9 45	9	6
Abrolhos, Brazil -	3 20	6-7		Al Bidá, Persian Gulf -	8 30?	6?	
Abtao I, Patagonia, W.C.	0 50	18		Alabat Harbour, Luzon -	10 0	9	
Abú-shehr, Persian Gulf	7 30	7		Alan Island, Patagonia, W. Coast.	0 31	18	
Acajutla, Central America	2 25	9		Albany Ids. (Port Albany) Australia, E. Coast.	12 15	10	7
Acapulco, Mexico, W. Cst.	3 6	1¼		Albemarle Id., Galapagos	2 0	6	
Acheen Head, Sumatra -	8 45	8		Port, Falkland	7 15	7	
Achillbeg, Ireland - -	5 14	10¾	8	Islands.			
Adams Port, (Mary Id.) Yellow Sea.	2 0	10		Albert River (Kangaroo Point) Australia, N. Coast.	7 30	10-13	
Adelaide Port, Australia, S. Coast.	5 44	6		Aldabra Ids., Mozambique	5 0	10	
Aden and adjacent Bays, Arabia, S. E. Coast.†	{ 7 30 to 9 30 }	7	4½	Aldborough, England -	10 45	8?	6½?
Adenara, Flores, Malay Archipelago.		8		Alderney, English Chan- Alert Bay, Cormorant Id., Johnstone Strait, Vancouver Id.	6 46	17 15	12½
Admiralty G., Australia, N.W. Coast.	12 0			Alexander Port, Africa, S.W. Coast.	3 0	5	
Adolphus Id., Torres Strt.	12 15	10		Algeçiras, Spain -	1 49	4	2½
Adou Atoll, Maldives -	1 0	4		Algoa B., Africa, S. Cst.	4 0	4-5	
Adou Matte Atoll, Mal- dives.	3 0	4		Alligator Rvr. Australia, N. Coast.	8 40	19-20	
Adventure Cove, Tierra del Fuego.	3 10	4					
Port, New Zealand.	12 20	8	6				
Sound, Falk- land Islands.	5 30	5½					
Agadir, or Santa Cruz, Africa.	12 45	9					
Aggerminde, Jutland -	4 9	2					
Agnes, St., Scilly Isles -	4 30	16	12				

* By the Rise of the Tide is meant its vertical rise above the mean low-water level of Spring Tides.
† From a Survey of Aden Anchorage by Commander Dayman, R.N., H.M.S. Hornet, 1863; but according to the Surveyors of the Indian Navy, springs at Aden rise 8½ feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neaps.			Spring.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
of Forth,	3 18	17½	15	Aor Pulo, Sumatra, N.E. Coast.		5	
many - -	5 19	7		Aotea Harb., New Zealand	10 0	12	9½
Ioluecas -	0 33	7		Apalachicola B., Gulf of Mexico.		2½-4	
, Netherlands	9 0	7		Appetetat B., Gulf St. Lawrence.	11 10	5?	3?
llum Rd., "	11 30	7		Appin Port (Loch Linnhe), Scotland.	5 26	12½	8½
, Nova Scotia	10 30	8	5	Appledore, England -	5 22	23	16½
m, (St. Joseph Ocean.	5 0	8½		Aquin Bay, St. Domingo	irr.	2-3?	
ales - -	10 30	18?	13?	Aracan R. (Bar), Bay of Bengal, E. Coast.	9 45	9	6
er Harbour),	12 0	18½	14½	Aracati, Brazil - -	6 0	8	■
st Coast				Araish El, Africa, N. Cat.	1 30	9-12	
, Lombok -	8 0	6		Arasaig, Scotland -	5 50	13½	10
Indian O. -	11 0	3		Aranco Bay, Chile - -	10 15		
, Persian G.	11 40	6		Arbroath, Scotland -	1 35	14	11
G. of Tartary	11 40	5-6		Arcachon, France - -	4 37	11½	9½
e., Port Blair,	10 0	9	6	Arcas Rks. G. of Mexico	noon	1½	
ean.				Ardglass, Ireland -	11 0	16	12
ortCornwallis	10 0	8½		Ardintallan, Loch Feochan, Scotland.	5 31	9	6½
rait, Indian	10 24	9½		Ardrihaig, Loch Fyne -	11 53	9	7½
y, Madagas-	3 30	7		Ardrossan, Scotland -	11 45	10	8
B., Patagonia,	0 45	5		Arenas Pt., San Carlos, Patagonia, W. Coast.	0 14	6	
t., Bay, G.	irr.	1-2		Argyle, Bay of Fundy -	9 27	12½	10½
rgin Islands	9 0	1½		Arica Road, Peru - -	8 0	5	
Inyang, S.	6 35	4		Arichat, Nova Scotia -	8 10	5	4
r, Africa, E.C		13		Arinagour, Coll Id., Scotland, W. Coast.	5 39	12½	9½
es - -	12 32	4½		Arkangel, White Sea -	7 28	2½	
, Hindoos-	10 30	9		Arklow, Ireland - -	8 45	4	3
ast.				Arnhem B., Australia, N.C.	8 0	6-8	
ena, Africa,	2 30	8		Arroa, Malacca Strait -		10	
st				Arthur Port, Tasmania -	7 52	4	
l, Patagonia,	0 45	5		Arundel, England -	12 25		
England -	11 56	20	14	— (Bar) - -	11 35	16	11½
ited States	4 38	1	1	As Rocas, S. Atlantic -	5 15	10	
Cape Breton	8 34	6	4½	Asaph St., B., Australia, N. Coast.	5 45	14	
United States	11 0	10½	9	Ascension Id., S. Atlantic	5 30	2	
Id., Africa	3 45	5		Aaskaig Port, Islay -	4 58	6½	4
G. St. Law-				Astoria, Oregon -	0 42	7½	6
t Cape -	1 0	5	3	Atacames Bay, Ecuador	3 37	13	
r Bay -	1 10	5	3	Atchafalay Bay, G. of Mexico.	irr.	2-2½	
st Point -	2 0	6	4	Athline, Loch Seaforth -	6 16	15	10
larb. R. St.	9 0	■	2	Atico Road, Peru - -	8 53	5	
				Auckland Harb., New Zealand, N. Island.	7 5	11	9
(English		2		Augustine St., U. States	8 21	5	4
ribbean Sea.				— St., B., Madag-	4 30	13	
lay (Port	4 0	5		agascar, W. Coast.			
Madagascar.				Aux Cayes Bay, St. Domingo.	irr.	2-3?	
St., Cuba		1½		Avatcha B., Kamchatka -	3 30	6½	4½
Port, Pata-	10 40	28		Avon Isles, Australia, E.C.	8 30	■	
Coast.				Avon River, Bigbury Bay, England.	5 47	16½	11½
Ma-	12 0	7					
it.							
G. St. Law-	10 30	5	■				
gium - -	4 25	15					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Awassima (Inland Sea) Japan.	0 14	7		Barataria Bay, Gulf of Mexico.	irr.	1½	
Awanni R., New Zealand	7 44	7		Barbados, Caribbee Ids.	irr.	2	
Axim, Africa, W. Coast.	4 30	4		Barbara Port, Patagonia, W. Coast.	12 28	6	4
Aylen Bay, Yellow Sea	2 30	6	4	— I. Santa, California	8 0	3½	
Aymann, Persian Gulf -	11 20	6		Barbe St., Sumatra, N.E. Coast.	6 0	6	
Ayr, Scotland -	11 50	8½	7½	— Sta. Id., California	8 0	3½	
— Point of, I. of Man	11 7	20½	16½	Barclay Sound (Island Harbour), Vancouver Island.	12 0	12	
Bab-el-Mandeb, G. of Aden	12 0	7		— Uchucklesit Harbour, Vancouver Id.		12	
Bachelor River, Magellan Strait.	1 40	5		Bardsey Id., Wales -	7 40	15	
Bacuit B., China Sea, E.C.	10 0	6		Barfleur, France -	8 51	17	13½
Badas Id., Linga Bay, Sumatra *	6 0 PM	12		Barmouth, Wales -	7 41	17	13½
Badong B. (S. Cst.), Baly	11 0	9½	11	Barnstable, United States	11 23	10	8½
Bagroo River, Sherbro River, Africa.				Barnstable Bar, England	5 30	19	14
Bahia, Brazil -	3 30	8		Barnstable Bridge, England.	6 38	10½	7½
Bahrein, Persian Gulf -	5 30	7		Barquero (entrance), Spain, N. Coast.	3 0	15	
Balabac Id., China Sea, E. Coast.	11 0	5		Barra, Id. (North Harbour), Scotland, W. C.	5 48	11½	6½
Balade Harb., New Caledonia.	6 30	4½		Barracouta Harb., G. of Tartary.	10 0	3½	
Balambangan Id., Borneo, N. Coast.	10 0	6-8		Barragan Bay, Rio de la Plata.*	7 0	5-9	
Balasore R., B. of Bengal, W. Coast.	10 0	15		Barren Id., China Sea, E. Coast.	9 30	5½	
Balbriggan, Ireland -	10 40	11		Barren Ids., Madagascar	4 45	12	
Bald Head, United States	7 26	5	4½	Barrow Harbour, Newfoundland.	7 10½	5½	
Ballachulish (Loch Leven), Scotland.	5 43	11		Barton Port, (Bubon Point), China Sea E.C.	10 55	6	
Ballinacourty, Dungarvan, Ireland.	5 12	12½	9½	Bas, Ile de, France -	4 49	23	17
Ballinskellig Bay, Ireland	3 40	12	7½	Básidüh, Persian Gulf -	12 0	10	
Ballycastle B., Ireland -	6 25	3	2	Basil Bay, Korea, W. C.	4 15	18	10
Ballycottin, Ireland -	4 54	12	0½	Basque Port, Newfoundland.	8 55	5½	3½
Ballycrovane, Kenmare River, Ireland.	3 42	10½	7½	Basrah (Bar), Persian Gulf.	12 0	*	
Ballynakill Bay, Ireland	4 40	12½	9½	— Town -	6 0½	9½	
Ballyness (Bar), Ireland	5 22	11½	8½	Bassein It., Bay of Bengal.	10 0	9	6
Ballysadare (Quay), Ireland.	6 0	8½	5½	Batanes, Bashee Islands, China Sea, E. Coast.		4	
Ballyshannon (Bar) -	5 18	11½	8½	Batavia, Java -	10 0	■	
Ballyweel, Ireland -	5 23	12½	8	Batchian, Gilolo, Moluccas	1 0	6	
Balta, Scotland -	9 43	6	4½	Bate (Gulf of Cutch), Hindoostan, W. Coast.	12 20	12	8
Baltimore, Ireland -	4 23	10½	8½	Bathurst, G. St. Lawrence	3 15	7	4
— United States	6 33	1½	1½	Bathz, Netherlands -	3 15	■	
Banana Ids., Africa, W.C.	8 15	9		Batiscan, R. St. Lawrence	9 48	3½	2
Bancoot R., (entrance) Hindoostan, W. Coast.	2 0	12		Batticalao River, Ceylon	5 0	2-3	
Banda, Moluccas -	4 0	6½		Bay of Harbours, Falkland Islands.	6 0	5	
Bander Alóleh, G. of Aden	6 45	6		Bay of Islands. (Motu Mea Islet,) New Zealand.	7 15	9	6
— Gorí, Gulf of Aden	8 45			Bay of Mercy, Banks Land		2	
— Sháab, Ind. Ocean	7 0	7		Bayonne (Bar), France -	3 45	12	10
— Feikam, Arabia, S.E. Coast.	10 0	8½					
Banff, Scotland -	0 28	10½	8				
Bantam, Java -		5					
Bantry Harb., Ireland -	3 47	10	7½				
Baracoa, Cuba -	7 23	2½					

* From observations made in the month of September by W. Stanton, Master Commanding H.M. Surveying Brig Saracen.

† In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. winds and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neap.			Spring.	Neap.
	h. m.	ft.	ft.		h. m.	ft.	ft.
pe, Africa, E.C.	4 15	10		Beypoor R. (entrance),	0 15	5	
nd, England -	11 20	20	15	Hindocstan, W. Cst.			
Prince Edward	9 0	6	3	Bias Bay (Tooniang Id.,)	8 0		
				China E. Coast.			
C. Breton Id.	8 30	4½	3	— (Taangchow Id.)	8 30		
d., Gulf St.	6 30	6	4	China, E. Coast.			
				Bic Id., G. St. Lawrence	2 15	14	8½
ited States -	7 26	3½	2½	Biddah R., B. of Bengal,	10 0	III	12
ngland -	{ 10 25 }	10	8½	W. Cst.			
Wales -	{ 12 15 }	21½	16½	Bideford, England -	6 7	16	
e, Vancouver	10 32	15		Bijouga Islands, Arcaas	10 10	11-14	
				Channel, Africa, W. Cst.			
z, Loughbo-	3 0	16	11½	Bissao,	11 0	8	
t, B. Columbia.				Africa, W. Cst.			
bour, Van-	0 30	15½		— Orango	10 0	III	
land.				Channel, Africa, W. Cst.			
a Scotia -	7 40	6½	4½	Bilbao (Bar), Spain -	3 0	13	
rbour, Prince	10 15	7	5	— (Town), „ -	3 20	9	
land.				Biloxi, G. of Mexico -	irr.	2	
y, Tierra del	0 30	7½		Bima Bay, Sumbawa -	Noon.	6	
				Binkang B. Chira Sea,	11 30	5	
ay, America,	0 30	9		W. Cst.			
and -	10 43	9½	8	Binnic, France -	6 3	30	22½
ort, La Plata	8 0	12	III	Bintula R., China Sea,	5 45	6	
Spitzbergen	8 56	3½		E. Cst.			
ar B., Labrador	9 0	4½	2½	Bird Island, China Sea,	9 30	6	
ay, Ceylon -	2 20	2½		E. Cst.			
efs (Middle),	8 30	6		— Ids., Africa, S. Cst.	4 0	4-5	
, E. Coast.				— Id. Light, United	7 59	8½	4½
1 Bay, Mada-	4 30	16		States.			
7. Cst.				Blaavand Point, Jutland	1 44	5	
Pt., England	11 0	14	10½	Black Ball Harb., Ireland	3 40	9½	7½
Scotland -	6 3	11½	8½	— Rock, Bay of Fundy	11 29	36	31
Sumatra -	6 0	3-5		Blacksod Bay (Quay), Ire-	4 47	III	8½
Brazil -	3 0	5		land.			
Africa, W. Cst.	2 30	57		Blair Harb., China Sea,	8 50	9	
Africa, S. Cst.	4 30	7		W. Cst.			
stle, Cleddau	6 33	20	14½	Blakeney, England -		9	
ales,				— (Bar) „	6 30	15	
or Burburra	7 15	9		Blanche Port, Streaky	1 0	5	
Aden) Africa,				Bay, Australia, S. Coast.			
				Blankenberg, Belgium -	12 48	III	11
ayana -	4 30	117		Blanco Cape, Africa, W. C.	11 46	6	
erway -	1 30	4		Blas, San, Mexico, W. Cst.	9 41	6½	
und, Falkland	5 0	7		— La Plata -	2 0	12	10
				Blasket Islands, Ireland -	3 30	11½	
Ireland Id., N.	7 14	4		Blewfields, Mosquito Coast	1 50	2	
Loch Roag,	6 11	11	8	Bligh Sound, New Zea-	10 45	8	6
l.				land.			
l., Sound of	6 11	13	9½	Block Id., United States	7 36	3½	2½
Point, Banks	6 30	12		Bluff Cay, Bahamas -	7 0	4½	
R., Gulf St.	2 0	12	7	Bluff Harb., New Zealand	1 18	8	6
e.				Blunden Harbour, Brit.	12 0	III	11½
otland -	2 18	15	11½	Columbia.			
1 Harb., G. St.	11 32	5	3	Blyth, England -	3 15	15	11
e.				— R., Southwold,	10 20	6½	4½
				England.			
				Boca de Varadero, Cuba	8 39	2	
				Bodega Port, California	11 17	4½	8½
				Bodkin Light, United	5 42	1½	1
				States.			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		ings.	Neaps.			ings.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Bojador Cape, Africa -	12 0	8?		British Sound, Madag-	4 0	9½	
Bolt Head, England -	5 45	15?	11?	gascar, E. Cst.			
Bombay Dockyard, Hin-	11 40	12-17		Broad Sound, Australia,	11 0	20-30	
doostan, W. Coast.				E. Cst.			
Bonacca Id., Bay of Hon-	9 0	1½		Broadhaven Har., Ireland.	5 0	10½	
duras.				Broadway R. (entrance),	11 0	7½	
Bonanza, Spain -	2 0	12½	8	China, E. Coast.			
Bonne Esperance Harb.,	9 15	5	2½	Broken Bay, Australia,	8 0	6-9	
G. of St. Lawrence.				E. Coast.			
Bonny R. C., Africa, Wst.	5 0	9		Broom Loch (Ullapool)	6 40	14½	10
Booby, Island, Australia,	4 30	8		Broughty Ferry, Scotland	2 22	14½	11
N. Coast.				Brouwershaven, Nether-	2 15	10	8
Bordeaux, France -	6 50	14	12½	lands			
Borja B., Magellan Strait	1 50	6½		Bruit River, Borneo -	3 0	11	
Borkum (Road) Germany	10 30	8 10		Bruni R., China Sea, E.	11 0	12	
Boscawen, England -	5 15	25	17½	Coast.			
Boston (Sluice), England	7 0	12		Brunsbüttel, Germany -	1 58	9	
—Deep (Clay Hole) „		21½		Brunswick B., Australia,	12 0	24	
—Hob Hole „		17		N.W. Cst.			
—(Charlestown Naval	11 27	11½	10	Brush, Yarmouth, England		5½	4½
Yard) United States.				Bubon Point, Port Barton,	10 55	6	
—Light, United States	11 12	11	9½	China Sea, E. Coast.			
Botany Bay, Australia, E.	8 15	7-8		Buctouche River, G. St.	3 30?	4?	2
Cst.				Lawrence.			
Boteler R., Madagascar -	4 30?	15?		Budehaven, England -	5 45	23	17
Boucaut, France -	3 39	8½	6	Buenaventura Port, Cen-	4 0	13	
Boughton Harb., Prince	8 40	5	2?	tral America (Negrilla			
Edward Island.				Reef).			
Boulogne, France -	11 25	25	19½	„ off the towp -	6 0	13	
Bourbon Id., Indian Ocean, see Reunion Id.				Buenos Ayres, S. America,	12 0	3-5	
Bouro (Cajeli Bay) Mo-	1 0	6		E. Coast.*			
luccas.				Buffalo R. (entrance),	3 45	4½	
Bow Island, S. Pacific -	2 40	3		Africa, S. Cst.			
Bowen Port, Australia, E.	9 35	16		Bulama Island (Arcas	10 10	14	11
Cst.				Channel), Africa, W.			
Bowling, R. Clyde, Scot-	0 39	9		Coast.			
land.				Bull Harbour, Goletas	0 30	12½	
Boyanna B., Madagascar,	4 30	15		Channel, Vancouver Id.			
W. Cst.				Bull Id., Newfoundland	7 22	3½	2
Bradore Bay, Labrador -	8 45	4	2	Bulls Id. Bay, United States	7 16	5½	4
Braha Harbour, New-	7 0?	2-3?		Bulls Mouth (Achill	5 38	10½	7½
foundland.				Sound, N. entrance,) Ireland.			
Bramble Cay, Torres Str.	9 15	12		Bulsaur R., Hindoostan,	1 45	18	
Brandy Pots, River St.	3 0	17	10	W. Cst.			
Lawrence.				Buluagan O'ta Ann Port,	12 0	5½	
Braas River, Africa	4 0	6		Filipinas.			
Brava, Africa, E. Cst. -	4 30	8		Bunawe (Loch Etive),	7 54	5½	
Bray Head, Ireland -	10 45	12	9½	Scotland.			
Brazos River, G. of Mexico	irr.	1½		Buncrana, Ireland -	5 40	16	
Bréhat, France -	5 51	31	23½	Bunessan, Scotland -	5 24	12	2½
Brest, France -	3 47	19	13½	Burburra, see Berberch.			
Bridgeport, United States	11 11	8	6½	Burin Harbour, New-	8 45	6½	4½
Bridgewater (Bar) England	6 50	35	26½	foundland.			
Bridlington, England -	4 39	16	12	Burntisland, Firth of Forth,	2 24	16½	12½
Bridport, England -	6 5	11½	7½	Scotland.			
Brielle, Netherlands -	3 0	5		Burntisland, Kyles of Bute,	11 50	10	8
Brighton, England -	11 15	19½	16	Scotland.			
Bristol (King Road) Eng-	6 56	44	33	Burong I., China Sea -	4 45	7	
land.				Burrard Inlet, Gulf of	6 0	16	
Britannia Bay, Sumbawa	1 0	11-12		Georgia, B. Columbia.			

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Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
rt, Wales -	6 1	25½	18½	Campeche, Yucatan -	1 45	2½	2
ce Abú-shehr.				Campobello (Welchpool),	11 21	23½	20
R. Bar, Persian	12 0			B. of Fundy.			
, Burias Island	12 30	6		Cancale, France -	6 20	37	27
lands, Hudson	6 50			Canna Id., Scotland, W.	6 19	14	9½
y, Australia, E.	9 45	6		Coast.			
e, Australia,	9 45	6		Canso Gut (Plaister	9 10	4½	3
t				Cove), Nova Scotia.			
ay, New Gra-	3 40	12		Har., C. Breton	7 48	5½	4½
ver, Africa, W.	7 45	8		Island.			
ain -	1 45	9½		Cantin Cape, Africa -	10 0	10	
nce -	10 57			Canton River (entrance),	10 0	8	
ien (Bar) -	6 10	26	19½	China.			
m, Wales -	9 33	13½	10½	Canton River } In Mar.	2 40	5½	
St. Domingo -	8 02	12		(Kuper Id.) }			
h, Ireland -	10 51	5½	5	} In May	1 40	5½	
, Bouru -	1 0	6		} & June			
ance -	11 49	19½	15½	Cape Coast Castle, Africa,	4 30	6	
each, Patagonia,	1 15	16		W. Coast.			
st.				Cape May Landing, U.S.	8 19	6	5
Fort, Patagonia,	1 18			Caracas River, Ecuador-	3 30	10	
st.	0 47	18		Caranquette Harbour, G. of	2 40	6	3
iver, Gulf of		2½	1½	St. Lawrence.			
Bengal -	2 30			Cardiff, Wales -	6 59	38	29
land, Bristol	6 0	24½	16½	Cardigan, Wales -	7 1	12	9
l.				Bay, Prince	8 40	5	3½
, Africa, W. Co.	5 0	9		Edward Island.			
Harbour, New	11 40	1½	1	Careening Bay, Australia,	11 45	30	
l.				N. W. Coast.			
3, Isle of Man-	11 17	16½	13	Caraimapu, Patagonia,	0 50	10	
nda, Hindoostan,	0 15	5		W. Coast.			
st.				Cargados Garayos Shoals,	2 0	■	
y, Peru -	5 47	4		Indian Ocean.			
astle Pt.), Eng-	11 30	13	9½	Cargreen, R. Tamar,	5 47	14½	10½
3. Tamar, Eng-	6 6	12½	8½	England.			
, Babuyan,	6 0	6		Caribou Harbour, Nova	10 0	6	4
Port, Spain -	3 0	15		Scotia.			
Banda Sea,	noon	6		Carleton Point, Gulf St.	3 0	6	4
arb., Australia,	12 0	37½		Lawrence.			
oast.				Carlingford (Bar or Cran-	11 0	14	11
Harb., Nodales	3 0	16	11½	field Point), Ireland.			
l, B. Columbia.				Carlisle Port, England -	12 10	20	14
R., Africa, W.	4 02	6		Carlos, San, Port, Pata-	11 15	6	
Cape, New Zea-	6 0	8	6	gonia, W. Coast.			
Island, South	12 0	43½		— (Arenas Point)	0 14	6	
Town, Gulf St.	4 0	10	7	Patagonia W. Coast.			
se.				— (English Bank)	0 4		
on, Scotland -	11 45	8½	6	Patagonia W. Coast.			
				Carlos, San, Port, Falk-	7 0	■	
				land Islands.			
				Carouge River, R. St.	7 15	16	11
				Lawrence.			
				Carrigaholt, Ireland -	4 44	14	10½
				Carsalg, Scotland -	5 28	10	7½
				Cartagena, New Granada	11 0	1½	1
				Carteret, France -	6 25	31	22½
				— Port, New Ire-		6	
				land.			
				Cascumpeque H., Prince	5 40	3	2
				Edward Island.			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Cashla Bay, Ireland -	4 33	16	12	Chapu Road, Hang-chu	12 0	25	
Casquets, English Channel	6 45	15½		Bay, China, E. Coast.			
Castillos, Cape, Rio de la	8 30	2		Charles Cape, United	7 45	5	
Plata.*				States.			
Castlereagh Cape, Tierra	2 50	4		Charles Id., Galapagos -	2 10	6	
del Fuego.				Charleston, United States	7 26	6	5
Castletown, Bearhaven,	4 14	9½	7½	Charlottetown, Prince	10 45	9½	7
Ireland.				Edward Island.			
----- Isle of Man -	11 10	20	16	Charlowka R., Lapland	8 8	11	
Castletownsend, Ireland -	4 21	10½	■	Chateau Bay, Labrador -	7 35	3½	1
Castries B., G. of Tartary	10 30	6		Chatham, England -	1 2	17½	14
Castro, Patagonia, W. Co.	0 11	18		----- Id., Galapagos	2 23	6½	
Casuarina Point, China	9 30	6½		----- Port, America,	1 0	12	
Sea, E. Coast.				N. W. Coast.			
Catalina Harbour, New-	7 0	6	4	Chatte Cape, United States	12 0	13	5
foundland.				Chauan Bay, China, E.	11 0	6½	
Catharina Sta. L, Brazil -	2 30	3		Coast.			
Cato Bank, Australia, E.C.	8 0	6		Chausey, Isles de, France	6 9	35	26
Catoche Cape, Yucatan -	9 30	1½		Cheduba, Bay of Bengal-	11 30	8	
Ottawade Bridge, Stour	1 8	4½		Ches-fow Harb., Yellow			
River, England.				Sea, see Chifu.			
Cavalli Ids., New Zealand	8 0	7		Chentabun River, China	10 0	5½	
Cavern Island, China Sea,	9 30	5½		Sea, W. Coast.			
E. Coast.				Chepo River, New Gra-	3 40	16	
Cawee Islands, Gulf St.	1 50	9	■	nada.			
Lawrence.				Chepstow, England -	7 30	38	20
Cay West, United States	9 30	1½	1½	Cherbaniani Reef, Lacca-	10 0	7	4
----- N.W. Channel, U.S.	9 10	1½	1½	dives, Indian Ocean.			
Cayenne, Guayana -	3 45	6-11		Cherbourg, France -	7 49	17	12
Cayenz, France -	11 5	27½	21	Chesulton, England -	6 13	10½	7
Ceara, Brazil -	4 30	9		Chester (Crane Wharf),	0 16	26	
Cedar Cays, United States	0 51	3½	2½	England.			
Cedeira, Spain, N. Coast	3 0	15		Chester River (Rockhall	5 23	2½	1
Centre Id., (Foveaux St.)	12 15	8	6	Creek), United States.			
New Zealand.				Chesterfield Islet, Aus-	8 30	5	
Ceram, Wahaay Harbour,	6 0	■		tralia, E. Coast.			
Moluccas.				Chetican, C. Breton Id. -	8 15	3½	
Cerros Id., California -	9 10	7-9		Chichester, England -	11 30	14	11
Centa, Africa, N. Coast -	2 6	3½	½	Chifu, Yellow Sea -	10 34	8	6
Chacachacara Id., Trin-	3 30	4		Chimmo Bay, China, E.	10 20	16	
idad, Caribbean Sea.				Coast.			
Chasco Bay, Patagonia,	0 40	14		Chimney Id., Rees Pass,	11 30	12	
W. Coast.				China, E. Coast.			
----- Narrows, Pata-	1 15	16		Chinchu Harb., China,	12 25	17	
gonia, W. Coast.				E. Coast.			
Chalky Inlet, New	11 6	8	6	Chin-hae, Yung R., China,	11 20	12½	
Zealand.				E. Coast.			
Chalmers Port, America,	1 0	13½		Ching-tau Bay, Yellow Sea	6 0	12	5
N. W. Coast.				Chipiona, Spain -	1 34	12½	8
Chamé Bay, New Gra-	4 0	16		Chittagong (Bar), Bay of	1 15	15	10
nada.				Bengal, E. Coast.			
Chamisso Id., America,	4 42			Chodo Id., Korea, W. C.	6 20	12	
N. W. Coast.				Choiseul Port, Madagascar,	4 0	5	
Champion Bay, Australia	9 10	1		E. Coast.			
W. Coast.				Chosan Harb. or Tsau-	7 45	7	5
Champlain R., St. Law-	9 45	■	2	liang-hai, Japan Sea.			
rence.				Christchurch, England -	9 0	5	
Changchi Id., China, E.C.	9 30	17		Christiansted, Santa	11 30	1	
Changuos Ids., Patagonia,	0 35			Cruz.	7 30		
W. Coast.							

* In the Rio de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. winds and depressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 ft.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs	Neaps.			Springs	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Christmas Island, Indian Ocean.	10 0			Colombo, Ceylon	1 0	2	
Christmas Harbour, Kerguelen Id.	2 0	2		Colonsay (Schallasaig) Scotland, W. Coast.	5 18	11	7½
Chuen-pee Point, Canton River.	2 0	7½		Columbia River, (entr.) America, N.W. Coast.	0 15	7½	
Chusan Archipelago, (Vernon Channel,) China, E. Coast.	9 40	■		Componee River, Africa, W. Coast.	10 0	15	11½
Chusan Tinghae, China, E. Coast.	11 0	12	9	Compu Inlet, Patagonia, W. Coast.	1 10	17	13½
Circular Head, Tasmania	11 40	9		Concarneau, France	3 12	13	9½
Clam Point, B. of Fundy	8 27	8½	6½	Condore, Cochin China	3 0	4	
Clara Sta., I., Ecuador	4 0	11		Congo River, Africa W. Coast.	4 30	6	
Clare I., Ireland	4 38	12½	9½	Congoon Bay, Persian G.	7 45	9½	
Clarence Port, America, N.W. Coast	4 25			Conil, Spain	1 18	11½	7½
Clarence Harbour, Long Island, Bahamas.	8 30	4	3½	Conquet Road, France	3 46	21	15
Clarke Harbour, Bay of Fundy.	8 40	9½		Constitution Cove, Bolivia	10 0	4	
Clayoquot Sound, Vancouver Id.	12 0	12		Conway Cape, Australia, E. Coast.	11 0	18	
Clear, Cape, Ireland	4 0	9	6½	Cook Harb. Newfoundland	7 25		
Clearwater Point, Gulf St. Lawrence.	11 30	5	3	Cooper Port, New Zealand.	3 50	7½	5½
Cleveland Bay, Australia, E. Coast.	7 30	10-12		Copiapó, Chile	8 30	■	
Cley, England, N.E. Cst.		5½		Coquet Road, England, E. Coast.	3 0	14½	11
Cliffen Bay, Ireland, W. Coast.	4 30	13½	10	Coquimbo Bay, Chile	9 8	5	
Clinch Fort, Fernandina, United States	7 53	6½	6½	Cordouan Lthse., France	3 37	13½	10½
Clonakilty, Bay, Ireland	4 30	11	8½	Corentyn River, Guayana	5 10	8½	6
Coacocho Bay, G. of St. Lawrence.	10 30	5	3	Coringa or Cocanada Bay, Bay of Bengal, W. C.	9 10	4-5	■
Cobija Bay, Bolivia	9 54	4		Coringa R. (Bar), Bay of Bengal, W. Coast.	9 0	5	
Cocagne River, G. St. Lawrence.	7 30?	4?	2?	Corisco Bay (Elobey Isles), Africa, W. Cst.	5 0	7	
Cochin Harb. and Road, Hindoostan, W. Coast.	1 0	3½		Cork (Penrose Quay), Ireland.	4 58	12½	10
Cockburn Port, Africa, E. Coast.	4 15	12		Corn Ida, B. of Honduras	1 45	2	
Sound, Australia, W. Coast.	9 0	1-1½		Corner Inlet, S. Australia	11 40	■	
Cockenzie, Firth of Forth, Scotland.	2 16	15½	13	Cornwall, Cape, England	4 35	18?	13?
Cod Cape, United States	11 30	13		Corpach (Loch Aber), Scotland.	5 59	11½	
Codroy Island, Newfoundland.	9 15	6	4	Corran (Loch Aber), Scotland.	5 43	■	8½
Colorado River, La Plata	4 0	9	7½	Corunna, Spain	3 0	15	
Colorados, R. La Plata	3 40	11		Coudres Id. (Prairie Bay), R. St. Lawrence.	4 25	17	10
Cold Spring Inlet, United States.	7 32	5½	4½	Courseulles, France	9 7	20	15½
Coleraine, Ireland	6 24	6½	4	Courtmacsherry, Ireland	4 36	10½	8½
Collier Bay, Australia, N.W. Coast.	11 45	36		Coverack, England	4 35	14½	11½
Colne Point, Colne River, England.	12 0	■	10	Cowes (West), England	10 45 11 45	12½	9½
Colombilla Cay, Pearl Cays, Caribbean Sea.	2 0	■		Coy Inlet, Patagonia, E. Coast.	9 30	40	
				Coyhuin River, Chile	0 52	21	
				Coxumcl, B. of Honduras	8 30	1½	
				Crane Island, River St. Lawrence.	5 24	17	18
				Cranford Bay, Mulroy Bay, Ireland.	8 3	4	
				Crapaud, Prince Edward Island.	10 0	8	6

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neap.			Spring.	Neap.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Crichton Harbour, Korea, S. Coast.	9 50	11½	8½	Danno R., Hindoostan, W. Coast.	1 30	17	
Crimon Ida., Java Sea -	8 0	6	5	Darnley Id., Torres Strait	9 30	12	
Criman, Scotland -	4 49	6½	5	Dartmouth, England -	6 16	14½	1
Crook Harbour, Newfoundland.	6 30½	4½		Darwin H., Choiseul Id., Falkland Islands.	6 30	5½	
Croisilles Harbour, New Zealand.	9 0	12	8	Darwin Port, Australia, N. Coast.	5 30	17-24	
Cromarty, Scotland -	11 56	14	11	Dauphin Port, Madagascar	4 30	7	
Cromer, England -	7 0	14½	11	De Roompot, North Sea	12 30	12	8
Crow Harb., Nova Scotia	8 0	6½	4½	Deal, England -	11 15	16	13
Crowdy Head, Australia, E. Coast.	9 15	5		Deep Harbour, Fife Sound, B. Columbia.	12 0	16	11
Crooked Id., Bahamas -	7 0	2½		— Point, Darian Strait	5 0	10	
Crookhaven, Ireland -	4 9	9½	8	Deer Sound, Orkneys -	10 30	10	7½
Cucao Bay, Patagonia, W. Coast.	12 0	6		Delagoa Bay (Port Melville), Africa, S. Coast.	4 30	15	
Cuckolds Point, River Thames, England.	1 45	10½	15½	Delagoa Bay (Portuguese Factory), Africa, S. Coast.	5 20	12	
Culdaff Bay, Ireland, W. Coast.	5 53	8½	6	— Shefeen Id., Africa, S. Coast.	4 40	12	
Culebra or Passage Id., Caribbean Sea.	9 0	1		Delaware (Breakwater), United States.	8 0	4½	3½
Cullen Harbour, Fife Sound, B. Columbia.	12 0	16	11½	Delftzyt, Germany -	11 15	8-10	
Cullin Id., Patagonia, W. Coast.		20		Delgado C., Africa, E. C.	4 0	16	11½
Culpepper Id., Galapagos	7	7		Delhi River, Sumatra -	4 0	8	
Cumberland Basin, (Sackville) Bay of Fundy.	11 55	45½	38	Demerara R., Guayana -	4 45	9	6
Cumsingmun Harbour, Canton River, China.	12 6	6½		Denham Sound, Sharks Bay, Australia, N.W. Coast.	12 5	5	
Cupehi Point, China, E. C.	8 0			Denial Bay, Australia, S. Coast.	12 15	8	
Cupica Bay, New Granada	3 30	13		Denison Port, Australia, E. Coast.	9 36	6	
Curieuse, Seychelles, Indian Ocean.	5 10	7		Desire Port, Patagonia, E. Coast.	12 10	18½	
Curtis Port, Australia, E. C.	9 40	10-12		Devonport Dockyard, England.	5 43	15½	11½
Cuttyhunk, United States	7 40	4½	3½	Dewghur Harbour, Hindoostan, W. Coast.	11 25	9	
Cutwell Harbour, Newfoundland.	7 0½	2-4½		Diamond Island, Bay of Bengal.	10 30	8	
Cuxhaven, Germany -	1 8	10		— Point, Malacca Strait.	12 0	9½	
Cuyler Harb., California	9 25	5	4	Diego, San, Bay, California.	9 38	5	3½
Cypress Harbour, Sharp Passage, B. Columbia.	12 0	16	11½	Diego, San, Cape, Tierra del Fuego.	4 30	10	
Dagga Sound, New Zealand.	11 30	8	6	— Garcia Island, Indian Ocean.	1 30	6	
Dahouet, France -	6 5	32	23½	— Ramirez Id., Tierra del Fuego.	4 0	6	
Dalawan Bay, China Sea, E. Coast.	11 0	5		Dielette, France -	6 40	27	20½
Dalcabue, Patagonia, W. Coast.	0 26			Dieppe, France -	11 6	27	20½
Dalhousie Harb., G. St. Lawrence.	3 10	9		Digby Gut, B. of Fundy	11 0	27½	23
Dalkey Island, Ire'and -	10 45	13	11	Dillon Bay, Erromango Id., Banks Ids.	5 30	4	
Dalrymple B., Madagascar W. Coast.	5 0	15		Dingle, Ireland -	3 51	10½	7½
— Prt., Tasmania	12 5	10	7½	Discovery Port, America, N. W. Coast.	2 30	7	
Damaon Bar, Hindoostan, W. Coast.	1 30	17					
Dampier Strait, Moluccas		11					

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
on Harb., Tierra	1 40	4		Eden Harbour, Patagonia,	12 30	5	
ego.				W. Coast.			
ad, Hindoostan,	2 0	6		Edgar Port, Falkland Is.	7 15	■	
ast.				Edgartown, United States	12 16	2½	2
'ance - -	9 39	21	16	Edina, Africa, W. Coast	5 50	4	
, Bay of Bengal		5		Edmonstone, Id., Sherbro			8
ighthouse, U. S.	7 33	7½	7	River, Africa.			
we Bay, Ceylon	1 50	1½		Egg Id. Id., United States	9 4	7	5½
iver, Hight of	4 17	5		G. St. Lawrence	2 0	11	6
				Egmont Bay, Prince	3 0	4	2
, San, Port, Pa-	12 0	7		Edward Island.			
, W. Coast.				— Port, Falkland	7 30	■	
dee, Ireland -	11 13	11½	9	Islands.			
Harb., Ireland -	5 18	11½	8½	Elides Fiord, Færoe Ids.	11 0	9½	7½
ve, Tierra del	3 0	4		Elgg Id., Scotland -	6 15	14	10
				Elbe, Entrance, Germany	12 0	11	
Road, Scotland	11 47	11		Elena Sta., Port, Pata-	4 0	17	
Comoro Ids.	4 0	11-12		gonia, E. Coast.			
Isle of Man -	11 12	20½	16	— Bay Ecuador -	1 18	8	
oad, Bahamas -	8 30	4	2½	Elizabeth Bay Africa,		5-6	
ngland -	11 12	18½	15	S. W. Coast.			
a Reach, Orwell,	12 27	12		Ellen Port, Islay -	5 0	5	4
d.				Ellenwoods Anchorage,	9 54	13	10½
Mouth, Carib-	3 0	4		Bay of Fundy			
ea.				Elliot Port, Australia, S.C.		5-6	
ay, California -	11 41	4½	3½	Emden, Germany -	12 0		
Harb., St. Juan	2 0	12		Ems River, (outer buoy),	10 0	8-10	
a Strait.				Germany			
(Bar), Ireland	11 0	11½	9	Enconter Rock, Yellow	10 44	11	■
ie of Mull -	5 0	12	10	Sea.			
Bar), Ireland -	11 12	12-14	9-11	Endeavour R., Australia,	8 0	5-10	
on, Scotland -	0 20	9		N Coast.			
Scotland	2 8	14½	11	— Strait, Aus-	1 0	9½	
Hindoostan, W.	10 10	8		tralia N Coast			
				Endermo Harbour, Japan	5 30	6	
n, Ireland -	3 51	10½	7½	English Bank, San Carlos,	0 4		
y Ness, Scot-	10 14	10	7	Patagonia, W Coast.			
				English Harbour, Antigua		2	
Ireland -	10 56	13½	11½	English R., Delagos Bay,	7 30	5	
Scotland -	2 32	14½	11½	Africa, S. Coast.			
s, England -	10 45	21½	19	Enora Bay, Japan Sea -		4	
and, Australia,	9 28	6-10		Eran Bay, (Palawan)	10 10	6½	
t.				China Sea, E. Coast.			
ie, France -	12 8	16½	13½	Erebus Bay, Barrow Str.	12 6	8	
n, Kenmare R.,	3 45	10½	8	Erme River, Bigbury	5 40	16½	11½
				Bay, England.			
s Harb., Ireland	3 57	9½	7½	Erqui, France -	5 59	33½	24½
Ireland -	5 27	12½	9½	Erronan or Futuna, S.	7 24	4	
Port, Africa,	4 45	12		Pacific.			
t.				Escamenac, Pt., Gulf St.	4 10	4	2½
y, New Zealand	11 15	10	8	Lawrence.			
ar), White Sea		3½		Esperanza Inlet, Van-	12 0	12	
Africa, S. Cst.	2 50	5		couver Id.			
ound, Scotland	5 10	10-12		Espirito Bay, Brazil -	3 0	4	
, South Pacific	2 0			Espirito Santo, C., Ma-	8 30	35-40	
, New Zealand	8 55	7		gellan Strait.			
, Prince Edward	8 30	3½	2	Esquimalt, St. Juan de	irr.	7-10	5-8
				Fuca Strait.*			
France -	6 32	31	22½	Essington Port, Australia,	3 24	15	
Pt., Australia,	9 39	7		N. Coast.			
t.							

* May to October from Midnight to 3 am. November to April from Noon to 3 pm.

Place.	High Water, Full and Change.	Rise. Springs. Neapa.	Place.	High Water, Full and Change.	Rise. Springs.
	h. m.	ft.		h. m.	ft.
Estevan, San, Port, Patagonia, W. Coast.	0 15	5	Flamand Bay, St. Domingo	irr.	2-3?
Etches Port, America, N.W. Coast.	1 15	9½	Flamborough Hd., England	4 30	16
Evangelista, Patagonia, W. Coast.	1 0	5	Flamenco Port, Chile	9 10	5
Exmouth, England	6 21	12½	Flatholm Ida., Bristol Channel.	6 54	37?
Exuma, Bahamas	7 20	2½	Fleetwood Port, England	11 12	26½
Eyemouth, Scotland	2 15	15?	Wyre Light	11 11	27
Eyre Port, Australia S. C.	10 30	6	Flesh Bay, or Bay St. Bras, Africa, S. Coast.	3 30?	6?
Fair Isle, Shetlands	11 0	5	Fleur-de-lis Harb., Newfoundland.	7 15	2-4
Fairy Port, Australia, S.C.		4	Flinders Group, Australia, E. Coast.	9 15	8-12
Falkland Sound (N. entrance), Falkland Ida.	6 45		Florida Cape, United States.	8 34	1½
(S. entrance)	7 0		Flushing, Belgium	1 20	15
Fall Harbour, Labrador	6 40	3½	Fog Ids., Hang-chu B., China, E. Coast.	11 45	17
Falmouth, England	4 57	16	Fogo Id., Newfoundland	7 20	4
False Point, Bay of Bengal, W. Coast.	8 0	8	Folkstone, England	11 7	20
Famine Port, Magellan Strait	12 0	6	Folly Point, Petitecondiac River, B. of Fundy.	11 49	45
Fane Id., Plumper Sound, Oregon.	irr.	12	Fongwhang Group (Bullock Harb.) China W.C.	8 30	17
Fannings Id., S. Pacific		4	Forçados River, Bight of Benin.	4 22	5
Fanny Hole, Mulroy Bay, Ireland.	6 17	9½	Forecarraeh R., Africa, W.C.	7 40	11
Fansiak Channel, Canton R., China, E. Coast	1 0	7½	Formby Point, England	10 35	28
Farallon, South, California	10 37	4½	Formosa Mt., Malacca Str.	8 0	11
Fareham (close to the Upper Quay), England.	11 48	11½	Fort Dauphin, St. Domingo	7 0	5½
Bridge, England.	11 51	7½	Fortune Bay, Patagonia, W. Coast.	0 50	7
land.			Forward Harb., British Columbia.	3 0	16
Farewell, Cape, New Zealand.	9 20	14	Foulness, Crouch River, England.	12 5	14½
Fatalizio, Japan Sea	6 0	5	Fowey, England	5 14	15
Fayal, Azores, Atlantic Ocean.	11 45	4	Fowlers B., Australia, S.C.	10 30	6
Fear, Cape, River, United States.	7 19	5½	Fox Bay, Falkland Ida.	7 0	6
Fécamp, France	10 44	11½	Foyle Lough (Warrenpoint), Ireland.	6 20	6½
Fenit, Tralee Bay, Ireland	4 3	12½	Foynes Island, Ireland	5 35	15½
Feolin Ferry, Jura	4 41	6½	France, Port de, New Caledonia.	8 25	4
Fernandina, Clinch Fort, United States.	7 53	6½	Francis, St., Bay, Tierra del Fuego.	4 0	
Fernando Noronha Island, S. Atlantic.	4 0	6	Francisco, San (North Beach), California.	12 6	4½
Fernando Po, Bight of Biafra.	4 0	7	Fraser River (entrance), British Columbia.	6 30	7-10
Ferro, Canary Ida.	12 30?	9?	Fraserburgh, Scotland	0 40	11
Ferrol, Spain	3 0	15	Frechette Id., River St. Lawrence.	8 0	14
Ferry Side, South Wales	5 49	23	Frederick Reef, Australia, E. Coast.	8 0	6
Filey Bay, England	4 20	16	Frederickshaab, Greenland.	6 3	12½
Finisterre, Cape, Spain	3 0		Freycinet Estuary	4 15	3½
Fish Hd., G. Manan, Bay of Fundy.	11 16	22½	Reach, Sharks Bay, Australia N.W. Coast.	3 0	5
Fishguard, Wales	6 56	11½			
Fitz-Roy Id., Australia, E. Coast.	9 15	7-12			
Fitzroy Port, Falkland I.	4 45	6			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
bstadt, Denmark	2 37	9		Gibraltar (old Mole)	2 20	3½	
o, Brazil -	2 40	4½		Spain.			
Cape, Magellan	1 0			Gigha Sound, Scotland -	2 22	4	2½
				Gijon Bay, Spain, N. Cst.	3 15	15	
ord, Faroe Ids.	11 15	6½	4½	Gilmorris Id., Africa, W.	6 0	11	
Bay, Madeira -	12 48	7		Coast.			
Newfoundland	7 0?	2-3?		Gizree Bunder, Indus,	9 50	7	
, Patagonia, W.C.	1 15			Hindoostan, W. Coast.			
bour, Tierra del	2 30	4		Glasgow, Scotland - -	1 25	9	7½
				Port, Scotland -	0 18	9	
Tierra del Fuego	2 30	4		Glenan Iles, France -	3 12	13	10
Hecla Strait,	7 0	8		Glennie Ids., Bass Strait	12 20		
Regions.				Gloucester Cape, Tierra	1 30	5	
l., Africa, W.C.	5 30	3		del Fuego.			
ay, Hainan Id.,		4-5		Harbour, Uni-	11 4	10¾	8¾
Sea.				ted States.			
ort, Magellan Str.	9 0	5½		Gluckstadt, Germany -	3 9	10	
inte de, Ceylon,	2 0	2		Goa, Hindoostan, W.C. -	11 30	6	
st.				Godbout River, Gulf St.	1 52	11	6
Port, Patagonia,	8 50	46		Lawrence.			
st.				Goeree (West Gat) -	1 45	7	
l., Africa, W. C.	6 45	4		Gollonsir Socotra, Ind.	7 20	8	
(Mull of) -	11 15	15?	12?	Ocean.			
Ireland - -	4 35	14½	11	Golovnin Bay, America,	6 23	3½	
l, G. of Mexico		1½	¾	N. W. Coast.			
l., Africa, W.C.	8 10	6-9		Gomera, Canary Ids. -	12 45?	9?	
Ids., Australia,	1 50	3		Gometra, Loch Tuadh,	5 29	11½	8
st.				I. of Mull.			
wn, Scotland,		17	12	Gonaives Bay, St. Domingo	8 0	1	
ast.				Goods Bay, Patagonia, W.	0 30	7	
Head - -	11 49	10		Coast.			
basin, Gulf St.	2 40	5	3	Good Hope, Cape of,	9 0		
nce.				China, E. Coast.			
d, United States	7 37	7		Good News, B. America,	6 15	13½	
hou Id., Gilolo		5		N. W. Coast.			
e, Moluccas.				Good Success Bay, Tierra	4 3	6-8	
Harbour, Aus-	2 50	2½		del Fuego.			
S. Coast.				Goold Island, Australia,	6 45	6	
ape, Nova Scotia	9 15	4	2	E. Coast.			
d'Elmina, St.	4 30	6		Gooriya Creek (entrance),	11 0	9	
, W. Coast.				Hindoostan, W. Coast.			
ort, B. of Fundy	11 17	32	28	Goose Cove, Newfound-	7 0?	2-3?	
St., Basin, Aus-	12 15	25		land.			
N. W. Coast.				Gorda Sound, Virgin	8 30	1½	
hoals, United	10 30	7		Islands.			
				Gore Port, New Zealand	9 0	8	6
Bay, Tasmania	9 42	3	2	Gorée, Africa, W. Coast	7 45	2½	
St., Sound, G.	1 31	1¾	1½	Goree Road, Tierra del	4 0	8	
xico, Mid en-				Fuego.			
				Goulburn Ids., Australia,	6 0		
- West entrance	irr.	2½-4		N. Coast.			
wn, United States	8 40	4½	3½	Goury, France - -	7 6	22	17½
— South Island,	7 56	4½	3½	Gowlland Harbour, Dis-	5 30	11	
States.				covery Passage, Van-			
Harbour, Hin-	2 40	9		couver Id.			
l, W. Coast.				Gracias, Cape, Harbour,	10 30	2	
St., France -	6 20	34	25	Bay of Honduras.			
Ne, Socotra,	7 0	7		Grand Cestos, Africa,	5 20	4	
Ocean.				W. Coast.			
Hashish, Arabia,	10 0	10		Harb., Gd. Manan,	11 7	21	17½
oast.				Bay of Fundy.			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Grand Lahou, Africa, W. Coast	4 20	4		Guinchos Key, Bahamas	7 40	3	
Grand Passage, B. of Fundy.	10 48	20½	17	Gun Cay, Bahamas	8 30	3	
Grand Port, Mauritius	1 0	1½		Gundavee R (entrance), Hindoostan, W. Coast.	2 0	19	
— Rustico, Prince Edward Island.	6 40	4	2	Gunfleet Sand, England	11 40	14	8
Grande-digue, Madame I., Cape Breton Id.	7 55	6½	4½	Gutzlaff Id., China, E. C.	11 30	15	
Grande Point, Chile	9 45	5		Guysborough, Nova Scotia.	8 20	6½	4½
Granton Pier, Scotland	2 20	16	12½	Gweedore (Bunbeg), Ireland.	5 32	11	8
Granville, France	6 13	37	27½	Haarlem, Netherlands	9 0		
Gravelines, France	12 0	19	15	Habitable Id., Lapland	7 9	9	
Graves Port, Howe Sound, Gulf of Georgia,* British Columbia.	noon	12		Habitants Harb., C. Breton, Id.	8 20	6½	4½
Gravesend, England	1 10	17½	14	Haimun Bay, China, E. Coast	9 0		
Great Barrier, Id. (Nagle Cove), New Zealand.	6 25	10	7	Haiti Cape, St. Domingo	6 0	3	
Great Barrier Reef, Australia, E. Coast.	8 48	7		Haiyun-tau, (Thornton Haven), Yellow Sea.	9 30	12	8
Great Fish Bay, Africa, W. Coast.	2 30	5-6?		Hakluyt Head, Nova Zembla.	1 30	4	
Great St. Lawrence Harb., Newfoundland.	8 30	7	4	Hakodadi Harb., Yezo Island, Japan.	5 0	3	
Greatman Bay, Ireland	4 39	15½	11½	Halifax, Nova Scotia	7 49	6	5
Green Island, River, St. Lawrence.	2 45	16	9½	Halt Bay, Patagonia, W. Coast.	0 30	8	
Greencastle Point, Ireland.	11 2	14	11½	Hamburg, Germany	5 29	6½	
Greenock, Scotland	12 8	9½	6½	Hamilton Port (Korea), Yellow Sea.	8 30	11	
Greenwich, England	1 43	■	15	Hammelin Pool, Sharks Bay, Australia, N W. Coast.	5 0	3½	
Gregory Bay, Magellan Strait.	9 45	23		Hammerfest, Norway	1 10	9	
Grenada (St. George Harb.), Caribbee Ids.	2 40	1½	½	Hammond Knoll, England, E. Coast.	7 40		
Grenadines, Caribbee Ids	3 0	1½	1	Hang-chu Bay (Sesham Ids.), China, E. Coast.	11 45	14	
Grey Port, Swan River, Australia, W. Coast	9 0	1-1½		— (Fog Ids.)	11 45	17	
Greytown, Mosquito Cst.	9 0	1½		— (Chapoo Rd.)	12 0	25	
Gribanika Pt. White Sea	4 50	3		— off Can-pu		32	
Griffith I., Barrow Strait	12 15	3½	2½	Hanover Sound, Bahamas	8 15	4	3
Griguet Bays, Newfoundland.	7 0?	2-3?		Harbour of Mercy, Magellan Strait.	1 22	4	
Grimaby, England	5 36	19½	15	Harbour Grace, Newfoundland.	7 30?	7?	
Grindstone Island, Bay of Fundy.	11 47	41	34½	Harbour Id., Nova Scotia	7 40	6½	4½
Grienez Cape, France	11 27	21½	16½	Hardy Port, New Zealand	9 55	8	6
Grondine, R. St. Lawrence	9 0	9	6	Haro Strait (Channels leading to, from St. Juan de Fuca Strait).	irr.	10-12	
Guambacho Bay, Peru	6 30	2		Harrington Port, England	11 5	26	19
Guardafui Cape, Africa, E. Coast.	6 15	6		Hartlepool, England	3 28	15	11½
Guarmey Bay, Peru	6 10	2		Harvey Pnt. (Galt Creek), Vancouver Id.	0 30	10	
Guatulco, Mexico, W. C.	1 30	5		Harwich, England	12 6	11½	9½
Guayaquil, Ecuador	7 0	11		Hastings, England	10 53	■	17½
Guaymas, Mexico, W. C.	8 0	4		— Harbour, Bay of Bengal, E. Coast.	10 40	13½	
Guernsey, (St. Peter Port,) English Channel.	6 37	26	18½	Hatteras Inlet, United S.	7 4	2½	2
Guia Narrows, Patagonia, W. Coast.	2 10			Haute Isle, Bay of Fundy	11 21	33	28½

* From observations made in the month of October.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neaps.			Spring.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Cuba - - -	8 14	3		Hobarton, Tasmania -	8 15	4½	3½
h Harb., Sand-	7 15	4		Hoe-e-tow Bay, China, E.	12 15	11	
d., Banks Ids.				Coast.			
dwest, Wales -	6 42	7½	2½	Hokianga R. (entrance),	9 45	10	
rance - - -	9 51	22	11	New Zealand.			
t., New Zealand	7 50	3		Hokianga R. (Kokohu)	10 15	10	7
ights, France -	5 45	31	23½	New Zealand.			
ou Pholo Atoll,	9 30	11		Hollesley, England -	11 30	8½	6½
ea.				Holmes Hole, United	11 43	1½	1½
y, Japan Sea -		5½		States.			
st., Bay, Africa,	2 30			Holsteinborg, Greenland	6 30	10	
ast.				Holy Island, England -	2 30	15	11½
-Id., S. Atlantic	3 11	3		Holyhead, Wales -	10 11	11	12½
- St. Sound, U.S.	7 9	7½	6	Hon-cohe Bay, China	11 30	5	
England -	4 43	15½	11½	Sea, W. Coast.			
d. German Ocean	11 33	9½	7	Hondenklip Bay Africa,	2 30	5½	
- Jersey, English	6 25	30½	21½	S. W. Coast.			
el.				Honfleur, France -	9 29	23½	18
te Approaches,				Honghai B., China, E. C.	10 0	6½	
l States.				Honolulu, Sandwich Ids.	4 0	2	
— Long Id.,	9 59	6	5½	Hongkong, China, E. C.	10 15	4½	
wells Dock).				Hoogly R. (W. entrance),	10 0	10½	
— N. of Astoria	9 48	6½	5½	Bay of Bengal, W.C.			
				Hooper Island, Korea,	9 16	11½	8½
— Pot Cove,	10 48	8½	6½	S. Coast			
part).				Hope Harb., Falkland Ids.	8 10	7	
— Wards Id.,	10 9	6½	11	— Sound (Mia-u-tau	10 24	6½	
rs Dock).				Group), Yellow Sea.			
aluis, Nether-	2 30	8	6	Horn Cape, Tierra del	4 40	9	
				Fuego.			
— Cape, United	8 0	4½		Horn or Blaavand Point,	1 44	5	
				Jutland.			
pe, United States	7 40	4		Horton Bluff, B. of Fundy	12 30	11	40
Port, Patagonia,	12 0	5		Hougue La, France -	8 42	18½	14½
III.				Hourdel, France -	11 26	27½	21
o Inlet, Strait of	6 0	13		Hout B., Africa, W. Cst.	2 20	5	
a, B. Columbia.				Houtman Rocks, Aus-	11 30	2½	
alet, Capricorn	9 0	10		tralia, N W Coast.			
Australia, E. C.				Howden, R. Tyne, Eng-		11	
a Port, Chile -	9 8	11		land.			
. Nicoya Gulf -	3 9	10		Howe, West Cape, Aus-	9 0	6	
Harbour, Van-	12 0	11		tralia, S. Coast.			
Id.				Howth Harbour, Ireland	11 9	13	11
Bay, Tierra del	0 30	6½		Huacho Bay, Peru -	4 45	3	
				Huaso Islands Patagonia,	12 0	7	
ge, Blackwater,	12 20	12	11	W. Coast.			
England.				Huapilinao Hd., Pata-	1 25	15½	
hin Bay, China,	7 0			gonia, W. Coast.			
st.				Huasco Port, Chile -	8 30	6	4
y, New Zealand	9 0	7		Huailad Inlet, Patagonia,	0 48	16-20	
Jutland -	2 45	5		W. Coast			
Cape May,	8 33	6½	5½	Hu-i-tau Bay, China, E.	12 15	11	
States.				Coast.			
ugh Bay, Prince	10 45	9½	7	Hukker R. (entrance),	10 30	11	
Edward Id.				Hindoostan, W. Coast			
Island New	11 32	3½		Hull, England - -	6 29	20½	16½
Bonia Islands.				— Bridge, Crouch R.,	12 25	16	11
Firth, Shetland	9 45	6½	5	England.			
ead, United States	7 19	7½	6½	Hulu Shan B., Yellow Sea	2 30	8	6
, Jutland -	4 28	1		Humboldt Bay, California	12 2	5½	4½

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs	Noaps.			Springs	Noaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Hunter Id., Bass Strait -	11 30	8		James Id., W. end, Galapagos.	3 10	5	
Port, Australia, E. Coast.	9 45	6-7		— R. (City Point) U.S.	2 11	3	
Hurst (Camber), England	{ 10 0 } { 12 0 }	{ 7½ }	6	Jashk Shoal, Persian Gulf.	9 30	8	
Husum, Denmark -	2 36	9		Jask Cape, Persian Gulf	6 0	6	
Hyanis, United States -	12 22	4	3	Jebogue, Bay of Fundy -	10 4	15	1
Ichabo Id., Africa, W. C.	1 0	6	4	Jedore, Nova Scotia -	7 45	6½	
Ilfracombe, England -	5 42	27½	21½	Jekatarina Ida., Lapland	6 23	10	
Iki, Japan Sea -	-	8		Jerba, Mediterranean -	3 10	7	
Ilha Grande, Brazil -	12 30	5	4	Jericoacoara, Brazil -	11 30	12	
Ilheo, Port d', Africa, W. Coast.	3 0	8-10		Jersey (St. Helier), English Channel.	6 25	30½	5
Iloilo Port, Filipinas -	12 0	5½		— (Rosel) -	6 15	30	5
Inagua, Bahamas -	8 0	3½	2½	Jervis Bay, Australia, E. Coast.	6 20	6-9	
Indefatigable Id., Galapagos.	1 56	6		Jezirat Arabi, Persian G.	6 30?		
Indian Cay, Florida -	8 23	2½	1½	— Hamar-al-nafir,	9 30	10	
Indus (Gizree Bunder), Hindoostan, W. Coast.	9 50	7		— Arabia, S.E. Coast.			
Inhambane R., Africa, E.C.	4 15	10		— Jün Persian Gulf	11 30	10	
Inishbofin, Ireland -	4 34	12½	9½	— Kabr " -		8½	
Inishkeel, Ireland -	5 10	11	8	— Kais " -	0 45	7½	
Inishturk, Ireland, W. Coast.	4 36	12½	9½	— Kharg or Káreg " -	8 0	6½	
Inkanskie, White Sea -	9 15	14		— Larek " -	10 15		
Inman Cape, Tierra del Fuego.	2 0	4		— Tumb " -		8	
Intsi Point, White Sea -	11 55	16		Jiddah, Red Sea -		3	
Inverary, Scotland -	12 0	10		Jiginsk Id., White Sea -	5 15	4	
Inverness, Scotland -	12 18	12	9½	Joao San, Brazil -	6 24	14	
Investigator Rd., Australia, N. Coast.	8 0	9		Johanna Id., (anchorage)	3 40	11	
Iona Sound, Scotland -	5 11	11½	8½	— Pomony Harb.,	4 0	11	
Ipawich, England -	12 35	13½		Comoro Ida.			
— United States -	11 26	10½	8½	John St., Bay of Fundy -	11 21	27	
Iquique Road, Peru -	8 45	5		— Newfoundland -	7 30	6	
Ireland Id., Bermudas -	7 4	4		— River, Africa,	4 0	5	
Isidro St., Cape, Magellan Strait	1 0	8		S. Coast.			
Island Harbour, Choiseul Id., Falkland Islands.	5 20	6		— River, U. S. -	7 28	5½	
Islay, Peru -	8 53	7		Jonquiere Bay, Gulf of Tartary.	10 0	6	
Ile-aux-Condres, R. St. Lawrence.	4 23	17	10	Joombas R., Africa, W.C.	8 10	6	
Iles de Loa, Africa, W. C.	6 35	13		Jooria, Hindoostan, W.C.	2 0	16	
Isolette Cape, Arabia, S.E. Coast.	9 0	10		Josef, San, Port, Patagonia, E. Coast.	10 0	30	
Ives, St., England -	4 44	21	15	Jourmain Island, New Brunswick.	9 30	6	
Jacinto, Port San, Ticao Id. Filipinas.	6 30	6		Juande Nova, Madagascar		5	
Jackson Port (N. Head), Australia.	8 15			Juan Fernandez I., Chile	9 30	4	
Jacmel, St. Domingo -	irr.	2-3?		Juan San, Porto Rico -	8 2	14	
Jaffrabat, Hindoostan, W. Coast.	11 35	9	7½	— San Port, Peru -	5 10	3	
James Id. (Adam Cove), Galapagos.	2 14	5		Juby Cape, Africa -		8	
— N. side, Galapagos.	2 34	5		Judith Point, United States	7 32	3½	
				Jukan Ida, Lapland -	9 0	13	
				Julian, San, Port, Patagonia, E. Coast.	10 45	30	
				Julianshaab, Greenland -	5 6	7	
				Julien, St., Harbour, } Newfoundland. } Junk Fleet entrance, Canton River, China.	7 21 A.M. 6 30 P.M.	4½	
				Junk River, Africa, W. C.	11 50	6½	
				Junkseylon Id. (E. Side), Malacca Strait.	5 45	5	
					10 0	11½	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Island, (Small Isles), Scotland.	5 3	3½	2½	Kilmichael Point, Ireland	8 30	4½	3
Lin Ferry " "	4 41	6½	4½	Kilrush, Ireland	4 42	14	10½
Penin, New Zealand.	5 30	8	6	Kincardine, Firth of Forth, Scotland.	2 53	17½	15
Harb. (entrance), Zealand.	10 55	10	8	King Id., Bass Strait	1 0		
aska, White Sea	6 50	7		King Port, Falkland Id.	7 30	5	
oint, Banks Strait	8 17*	12½		Kingsbridge, England	5 46	10	
ksha, White Sea	3 25	7		Kingstown, Ireland	11 10	11	8½
n Cape, White Sea	11 54	15		Kinsale, Ireland	4 43	11½	9
land, New Zealand	9 0	6		Kinsiang Point, China, E. Coast.	7 0		
Harb. (entrance)	10 30	9½	6	Kircubbin, Ireland	12 42	11½	9½
ostan, W. Coast.				Kirindi, Ceylon	3 30		
. Bay, Owyhee	3 49			Kirkcudbright, Scotland	11 10	28	
pan Sea	6 4	6½		Kirkwall, Orkneys	10 9	10	7½
. Netherlands	2 30	5	7	Kishm, see Kesm.			
Id., New Zealand	6 30	10		Kiswara Harb., Africa, E. Coast.	4 30	14	
Harb., New Zealand.	9 30	12		Kitnapatnam, Bay of Bengal, W. Coast.	11 0	1½	
				Elaskish Inlet, Vancouver Id.	12 0	12	
erry, Hindoostan	9 57	9		Knox Bay, Vancouver Id.	12 0	14	
erry, Ceylon	11 0			Koepang, Timor	11 0	9	6½
e, Bay of Bengal	11 30			Kokohu, New Zealand	10 15	14	7
Islands (Porte), Indian Ocean.	5 30	5		Ko-kun-to Group, Korea, W. C.	2 25	14	10
a B., G. St. Lawrence.	10 45	5	3	Kok-si-kon Pnt. Formosa) China Sea, E. Coast.	11 30	14	
Harb. (Formosa), Sea, E. Coast.	10 30	3		Koombanah B., Australia, W. Coast.	9 0	½-3	
e R. (W. Cove), Id.	3 52	10	7½	Koree R. (Monda Point), Hindoostan, W. Coast.	11 40	11	
reef, Australia, E.	8 0	5½		Koulo River	1 15	20	
ec River (Hannipoint), U.S.	11 15	9½	8	Kou Zomen, White Sea	3 30	6	
land, Bass Strait	11 10			Kovda Bay, White Sea	3 25	6	
Knock, England	11 47			Koweit, Persian Gulf	0 15	9	
Bay, Australia, E.	9 30	9-14		Krakaton, Strait of Sunda	7 0	4	
				Kuper Harbour, Korea, S. Coast.	9 28	11½	8½
White Sea	3 8	6		Port, America, N.W. Coast.	1 40	14	10½
Point, White Sea	4 30	5½		Kuriyán Muriyán Bay and Islands, Arabia, S.E. Coast.	8 20	6½	
en Island, Indian	2 0	2		Kurrachee, see Karachi.			
. Persian Gulf	11 0	12		Kweshan Ids., China, E. Coast.	9 30	14	
ove, United States	7 48	5	4½	Kyem River, White Sea	5 23	4	
erámeh, Arabia, Coast.	9 30	10		Kykduin, Netherlands	7 0	12	
Phyou Harbour, of Bengal.	10 0	9	6	Kyle Akin, Loch Aish, Scotland.	6 16	15½	11
. Ireland	4 16	13	9½	Kyle Rhea, Scotland	6 0	14	11
it., Hebrides	5 30			Kynquot Sound, Vancouver Id.	12 0	14	
Id., Lapland	6 45	12		Ia Poile Bay, Newfoundland.	9 0	6	4
n Cove, Ireland	4 34	15½	11	Labuan Id., China Sea, E. Coast.	9 45	6	
Bay, Ireland	5 22	10½	8	Labyrinth Ids., Magellan Strait.	0 30	5½	
r Bay, Arran Ids., Id.	4 28	13½	10				
olme (Humber England.	6 2	19½	15½				
ga, Ireland	5 16	11½	8½				
gh, Ireland	12 40	11	9½				

* In N.W. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Lacul Harb., St. Domingo	6 0?	3?		Lerwick, Shetland	10 30	6	4
Lady Bay, Australia, S. C.		4		L'Etang Harb., Bay of Fundy.	11 19	23½	20
Lady Elliot Islet, Australia, E. Coast.	9 0	7-8		Leubu River, Chile	10 30	5	
Lagos, Portugal	2 7	13		Leven Port, Madagascar	3 30	7½	
———River (Bar), Bight of Benin.	6 0	3		Levrier Bay Africa, W. Coast.	12 0	6-7	
Lagos River (Consulate Wharf.)		2		Lewis Cape, St. Labrador	6 30		
———(Palaver Ids.)		1		Liant Cape (G. of Siam), China Sea, W. Coast.	5 7	6½	
Laguimanoc Port, Luzon	1 30	5½		Liau Ho (Bar), Yellow Sea.	4 0	11½	7½
Laguna de Terminos, G. of Mexico.	noon.	1½		———(entrance)	5 0	12	
Lamalin, Newfoundland	9 15	8½		Liau-tung, Chingho, Yellow Sea.	1 20	6½	
Lambayeque Rd., Peru	4 0	3		———Gulf (Sand Point), Yellow Sea.	4 50	7	5½
Lamlash, Scotland	11 49	10	7	———N.W. Head of Gulf.	5 30	10	8½
Lamo Harb., Africa, E. Coast.	4 6	11		Limerick, Ireland	6 16	18½	13½
Lancaster, England	11 16	8½		Lindy River (entrance), Africa, E. Coast.	4 15	12	
Landshipping, Cleddau River, Wales.	6 27	20	14½	Lingeh, Persian Gulf	12 0?		
Langshan Crossing, Yangtse-Kiang.*	1 40	12	8	Lintin Island, Canton R. China, E. Coast.	12 0	7½	
Lankeet Island, Canton River, China.	11 20	6½		Lisbon (Belem), Portugal	2 30	12	9
Lansew Bay, China, E. C.	10 0	13		Liscanor Bay, Ireland	4 23	13½	10
Lanzarote, Canary Ids.	1 0?	9?		Liscomb Harb., Nova Scotia	8 0	6½	4½
Laredo B, Magellan Strt.	11 30	9		Lishan Bay, China, E. C.	10 15	16	
Larga, Scotland	11 50	10		List, Denmark	2 21	6	
Latham Id., Africa, E. Cst.	4 0	10		Litau Bay, Yellow Sea	3 0	6	4
Latitude Bay, Tierra del Fuego.	2 5	4		Litke Ridge, White Sea	11 45	15	
Lau-mu ho, Yellow Sea	1-30	5		Little Egg Harbour, } United States	7 10	4½	3½
Laun, Great and Little, Newfoundland.	8 15	7	4	Little Fish Bay, Africa, W. Coast.	2 30	5-6?	
Laura Harb., Tierra del Fuego.	1 0	6		Little Gull Island, U. S.	9 38	3	2½
Lavata Bay, Chile	9 20	5		Littlehampton, England	11 36	16	11½
Lawrence, Great St., Harb. Newfoundland.	8 30	7	4	Little Metis, G. St. Lawrence.	2 10	13	8
Le Have Cape, Nova Scotia.	7 48	7	5½	Little Milford Quay, River Cleddau, Wales.	6 31	19	13½
———Nova Scotia, Crooked Channel.	7 51	7½	6	Little Natashquan, G. St. Lawrence.	11 0	5	3
———Mothers Island	7 51	7	5½	Liverpool, England	11 23	26	20½
———Getsons Cove	7 55	7½	6	———Bay, Nova Scotia.	7 50	8	5
———Bridgewater (McKean's Wharf.)	8 6	8	6½	Liza Bay, Lapland	5 58	9	
———Lunenburg (Spidlers Cove.)	7 54	7½	6	Lizard Id., Australia, E. Coast.	9 15	7-10	
Le Maire Strait, Tierra del Fuego.	4 0	7		———Point, (Perran Vose Cove), England.	5 0	14½	10½
Leervig Fiord, Færø Ids.	0 30	6½	4½	Llanelly (Bar), Wales	6 16	28	21
Leith, Scotland	2 17	16½	12½	Lloyd Port, Bonin Ids.	6 8	3	
Leman Shoal, England, E. Coast.	6 0			Loanda, San Paul de, Africa, W. Coast.	4 30	5	
Lennox Cove, Tierra del Fuego.	4 40	8		Lobah Point, Banka Strt.†	11 0†	10	
Leopold Port, Barrow Strt.	12 6	6	4½	Lobito B., Africa, S.W. Coast.	2 20	5	
Lepreau, Bay of Fundy	11 18	24½	21				

* At the Langshan Crossing the tide rises for 3 hours only, and falls for 9 hours.—H.M.S. Actæon, 1861.

† In S.E. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Point, Peru -	8 0			Louis Port, France -	3 11	13	9½
Bay, Bahamas -	7 40	3		— Mauritius -	12 30	3	2½
Head, Patagonia, Coast.	0 29			Louis, St., Bay, St. Domingo.	irr.	2-3?	
Aline, Scotland -	5 33	13½	10½	Louisburg Harb., Cape Breton Id.	8 0		4
Alsh " -	6 16	15½	11	Low Bay, Falkland Ids.	5 0	5½	
Boisdale " -	5 47	12½	9½	— Port, Patagonia, W. Coast.	0 40	7	
Broom " -	6 40	14½	10½	Lowestoft, England -	9 57	6½	5½
Carron " -	6 29	16½	11½	Luabo River (entrance), Africa, E. Coast.		22	
Cuan " -	5 36	13	9½	Lucas San, Bay, California	9 20	9½	
Duich " -	6 0	15½	11	Lucipara Pass, Banka Strait.	irr.	10	7½
Dunvegan, " -	6 7	15½	11	Luis St., Texas, G. of Mexico.		12½	3
Eil (Head of Loch)	6 27			Luis Obispo, San, California	10 8	4½	3½
Eport " -	6 6	12½	9½	Lunaire Bay, Newfoundland.	7 0?	2-3?	
Eriboll " -	7 43	14½	11	Lundy Island, England -	5 15	27	20
Erisort " -	6 43	15½	11½	Lung-mun Harbour, Yellow Sea.	10 0	7	
Etive, Stonefield " -	7 3			Lyme Regis, England -	6 21	11½	8½
— Bunawe " -	7 54	5½		Lymington England -	{ 10 25 } 12 15	8	6
Ewe " -	6 39	14½	10½	Lynn Deep, England -	6 0	23	
Gail " -	12 6	10	6	— Harbour " -		18	
Hourn " -	5 45	13½	10½	— Road " -			
Inver " -	6 41	14	11	Mabou River, C. Breton Id.	9 0	4	
Laxford " -	6 44	15	11½	Macabé, Brazil -	2 30	9½	
Linnhe " -	5 26	12½	8½	Macao, China, E. Coast -	10 0	6½	
Long " -	12 6	12		Macassar, Celebes -	4 40	5½	
Maddy " -	6 6	12½	9½	McDougall Harb., Africa, S.W. Coast.	2 30	5½	
Moidart " -	5 44	13½	9½	Maceio, Brazil -	4 30	8½	
Nevis " -	5 47	14½	10	Machias, Seal Id., Bay of Fundy.	11 5	18	14½
Roag " -	6 11	11	8	Macowa, Red Sea -	0 30	2	
Ryan " -	11 12	11		Macquarie Harbour, Tasmania.	7 30	3	
Skipport " -	5 52	12½	9	— Port, Australia, E. Coast.	8 56	4-5	
Strivan " -	11 55	6		Macquereau P., G. St. Lawrence.	2 0	5	3
Sunart " -				Madame Id., Madagascar	4 0	5	
Tarbert, West, Har- Island, Scotland.	6 4	11½	8½	Madoc Port, Wales -	7 30	17	
Tarbert, East, Scotland.	6 10	13½	10	Madras Road, Coromandel Coast.	7 34	3½	
Tongue " -	7 53	15	12	Magadoxa, Africa, E. Cet.	4 30	8	
Torridon " -	6 20	15	11	Magdalen Id., G. St. Lawrence.	8 20	3	2
Tuadh " -	5 29	11½	8	Magdalena Sta., Island, Magellan Strait.	12 0	10	
en Ids., Norway -	12 0	9	7½	Magdalene B., California	7 35	6½	
a, Red Sea -	1 30	3		Mahato Id., Africa, E. C.	4 30	7	
R. (St. Nazaire), France.	3 40	15½	11	Mahneah R., Africa, W.C.	7 40	11	
s Point, Peru -	8 19	5		Mahone Bay, Nova Scotia	8 0	7	
ock, (Ampanam B.), Sea	8 0	8		Mahons R., United States	9 52	7	3½
on Bridge, England -	2 7	19½	16½				
— Docks, England -	1 57	19½	17				
onderry, Ireland -	8 1	7½	5½				
(East), England -	5 26	16	13				
out Point, United S.	0 58	2	1½				
r Cape, Africa -	4 30	4-6?					
ent (Port Louis), France.	3 11	13	9½				
Howe Island, S. Africa.	8 30	6					
an-kan, Yellow Sea	4 30	11	9				
1 Larne, Ireland -	10 48	6½	6½				
— Rossmore, Ireland	5 20	11	8				

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Maiden Rocks, Ireland, N.E. Coast.	10 43	6 $\frac{3}{4}$	6 $\frac{1}{4}$	Margate, England -	11 40	15 $\frac{1}{2}$	1
Majambo B., Madagascar	4 30	16		Maria Cape, Saghalin Id., Sea of Okhotsk.	2 0	5	
Makátein, Arabia, S.E. Coast.	9 0	6		Maria Sta., Id., Chile -	10 20	6	
Makalleh, Arabia, S.E. Coast.	8 30	7		Maria Van Diemen Cape, New Zealand.	8 0	7	
Makumba R., Madagasocar	4 45	17		Maristow, River Tavy, England.	5 47	8 $\frac{1}{2}$	4
Makung Harb., Pescadres, China Sea.	10 30	9 $\frac{1}{2}$	7	Marjoribanks Harbour, Korea, W. C.	3 30	29	
Malabrigo Port, Peru -	5 0	2		Mark, St., Bay of, St. Domingo.	8 0?	1?	
Malacca Strait (light vessel one fathom bank).	6 0	15	12	Marka or Muerka, Africa, E. Coast.	4 30	8	
Malacca Strait (off Mount Formosa).	8 0	11	8 $\frac{1}{2}$	Marks, St., United States	1 14	3	2 $\frac{1}{2}$
—— Road, Malacca St.	7 30	11	8 $\frac{1}{2}$	Maroni Bay, Comoro Ids.	4 53	10	
Malaga, Spain - -	12 0	3		—— River, Guayana	5 30	8	6
Malahide Inlet, Ireland	11 15	10	8	Martaban, Bay of Bengal	2 20	21	
Malcolm Atoll, Maldives	10 30	3		Martin, St., Cove, Tierra del Fuego.	3 30		
Maldon, Chelmer River, England.	12 32	10	6	—— C. Horn	3 50	8	
Malè, Maldives - -	12 30	3		Ids., Tierra del Fuego.			
Malludu Bay, Borneo -	10 30	6-8		Martin, St., de la Arena, Spain, N. Coast.	3 30	15	
Malo, St., France -	6 5	35	26	Martin Vas Rocks, South Atlantic.	3 45		
Malpelo Point, Peru -	4 0	10		Martinique, Robert Harb. Carribean Sea.		4-5	
Man-of-War Cay, Bahamas.	8 10	4		Mary, Cape St., Newfoundland.	8 30	7	5
Mana Island, New Zealand	7 0	8	6	Mary St. Harb., Madagascar, E. Coast.	4 0	5	
Manama, Persian Gulf -	5 20	7		—— Newfoundland -	7 40	7 $\frac{1}{2}$	5
Manawatu River, New Zealand.	10 0	8	6	Mary, Port St., I. of Man	11 10	20	16
Mancenilla Bay, St. Domingo.	7 0	4-5		—— St., Scilly Is. -	4 27	16	12
Mandavee Roads, Hindoostan, W. Coast.	11 50	15	11	Maryport, England -	11 3	18	13
Manicouagon River, R. St. Lawrence.	2 15	12	7	Mascot, Persian Gulf -	11 15	6	
Manila (Luzon Island), China Sea, E. Coast.	10 40	2 $\frac{1}{2}$		Mason B., New Zealand -	11 10	8	6
Manning River, Australia E. Coast.	9 15	4		Massacre Bay (Tasman corner), New Zealand.	8 45	13	9
Manora P., Karachi, Hindoostan, W. Coast.	10 30	9 $\frac{1}{2}$	6	Massacre Bay, Motu Pipi River, New Zealand.	9 50	14	10
Manorah R., Hindoostan, W. Coast.	1 30	16		Massowah, Red Sea -	1 0	3	
Manta Port, Ecuador -	3 4	6		Matan River, G. St. Lawrence.	2 15	11	7
Manukau Har. (entrance), New Zealand.	9 30	13	10	Maule River, Chile -	10 0		
Manybranch Harb., Falkland Ids.	7 40	7 $\frac{1}{2}$		Maulmain, Bay of Bengal,	2 0	22	17
Maplin Light (Thames), England.	12 5	14 $\frac{1}{2}$	10 $\frac{1}{2}$	Mauritius (Port Louis) -	12 30	3	2 $\frac{1}{2}$
Maquereau Point, G. of St. Lawrence.	2 0	5	3	—— (Grand Port) -	1 0	1 $\frac{1}{2}$	5
Maranham, Brazil -	7 0	16 $\frac{1}{2}$	10 $\frac{1}{2}$	May Cape, United States	8 19	6	
Marblehead, United States	11 30	12		Mayday Bay, Palawan -	9 55	3 $\frac{1}{2}$	
March Harb., Tierra del Fuego.	3 10	6		Mayhé Id., Indian Ocean	4 0	6 $\frac{1}{2}$	
Marcouf, St., France -	9 55	20		Mayotta Id., Mozambique	4 10	11 $\frac{1}{2}$	
Mare Harb., Falkland Ids.	6 0	6		Mayumba, Africa, S.W.C.		7	
				Mazambo Port, Madagascar.	4 30	15	
				Mazatlan, Mexico, W. Cst.	9 40	7	
				Meichen Sound, China, E.C.	12 30	17	
				Melbourne, Australia, S. C.	1 20	3	
				Melinda P., Africa, E. C.	4 15	11	

	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
, Africa,	7 40	11		Minimegash, Prince Ed- ward Island.	3 30	5	3
and Cay),	7 55	5-6		Minow Islands, Mada- gascar, W. Coast.	5 0	15	
. Coast.	6 1	18½	13¾	Minquiers Rocks, France	6 6	35	26
l -	3 40	15		Miramichi (Bar), Gulf	5 30	5	3
gonia, E.C.	7 50	3		St. Lawrence.			
ock, Ba-				Mira-por-vos, Bahamas -	9 30	3	2¼
, C. Breton	8 15	5½		Mirs Bay (Tide Cove),	10 0	6½	
				China, E. Coast.			
Paknam),	5 7	9½		Miscou, G. of St. Law- rence.	2 30	5	3
V. Coast.							
ht, U.S. -	7 45	4	2¾	Mississippi, S. W. Pass,		1½	
S.E. end,	6 0	4		Gulf of Mexico.			
				Mistanoque, Labrador -	10 30	6	3
a, S.E. Cst.	9 0	6¾		Mistley Quay, Stour R.,	0 48	11¾	
inks Land		2		England.			
New Zea-	7 21	7	5	Mobile, Gulf of Mexico	irr.	1-2	
				Mocha Island, Chile -	10 30		
of Bengal,	10 30	18		Mocha Road, Red Sea,	12 0	4½	
				(E. Coast).			
ova Scotia	10 6	5½	3½	Mogador, Africa, W. Cst.	1 18	10-12	
indoostan,	11 0	7		Molyneux Bay, New Zea- land.	3 0	8	6
ce -	9 36	21	17½	Mombaza Port, Africa,	4 0	11	
ova Scotia	7 50	8	5	E. Coast.			
ngland -	5 4	15½	12	Monach Ids., Scotland,	5 44	12½	8½
st, Bolivia	10 32	3		W. Coast,			
Sea -	1 48	15-22		Monckton (Railway),	0 15	47	37½
épôt Bay),	10 35	6		Bay of Fundy.			
				Mondego (Bar), Portugal	2 30	7	
roe Islands	3 12	6½	4½	Monganui Harb., New	8 15	9	7
azores -	12 30	6		Zealand.			
our Port,	5 30	3		Monomoy, United States	11 30	5½	4
ary.				Monrovia, Africa, W. C.	6 0	6	
Tierra del	3 30			Montauk Pt., United	8 20	2½	2
				States.			
Patagonia,	12 0			Monterey, California -	10 22	4½	3¾
				Montrose, Scotland -	1 25	13	10
, R. Tees,	3 55	13		Monts, Point de, Gulf St.	12 0	12	6
				Lawrence.			
Bight of	4 15	5		Moreno (Constitucion	10 0	4	
				Road), Peru.			
1 (St. Ann	5 56	24	18	Moreton Bay, Australia,	9 30	3-7	
, Wales.				E. Coast.			
, New Zea-	9 15	8	6	Morewellham, R. Tamar,	6 12	10½	6½
land.				England.			
l, Palawan,	10 27	2¾		Morjovets Id., White Sea	11 20	17	
				Morlaix Road, France -	4 53	24	18
orae Island,	11 50	10	6	Morro (Sandy Pt.),	5 0	11	
				Ecuador.			
ple Point),	10 45	19	14½	Mossel B., Africa, S.	3 30	6	
oast.				Coast.			
ng Island),	12 0			Moudinga Id., White Sea	5 50	3½	
oast.				Mount Desert Island,	11 10	13	
ipinas -	7 0	6		United States.			
ngland -	6 30	35	26½	Mourondava, Madagascar,	4 45	12	
our, Gulf	1 16	6	4	W. Coast.			
e.				Mouton Port, Nova Scotia	7 54	7½	5½
st. Lawrence	1 30	6	4	Moville, Ireland - -	7 6	7½	5½

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise
		Springs.	Neaps.			Springs.
	h. m.	ft.	ft.		h. m.	ft.
Mozambique Har., Africa, E. Coast.	4 15	12		Narrows (First), Magellan Strait.	9 0	36-42
Mucaras Reef, Bahamas	7 40	3		—— (Second), Ma- gellan Strait.	10 0	23
Muerka, <i>see</i> Marka.				Naruto (Fukura) Japan Sea.	6 17	7
Mugeres Harb., Bay of Honduras.	9 30	1½		Nash Point, Bristol Channel.	6 25	33
Mul of Cantyre, Scotland	10 35	4		Nasparte Inlet, Vancou- ver Id.	12 0	12
Mulroy Bay (Bar), Ireland	5 40	11½	8	Nassau, New Providence, Bahamas.	7 30	4
Mumbles Lt. House, Wales	6 1	27½	20½	Nassau Bay, Tierra del Fuego.	4 0	6
Mungalaum Id., China Sea, E. Coast.	11 0	5		Natal Port, Africa, S. C.	4 30	6
Mungullo or Mongallo R., Africa, E. Coast.	4 45	12		Naturaliste Channel, Sharks Bay, Australia, N.W. Coast.	11 45	6
Murdounah Id. (E. Cst.), Red Sea.	6 0	3		Navallo Port, France -	3 42	13
Murray Islands, Torres Strait.	9 30	10		Nazaire, St., France -	3 40	15½
Murray Pass, Bass Strait	11 10	8		Naze, The, England -	12 6	12½
Musa Port, Babuyan Ids.		5		Nee-ah Harbour, Oregon	12 33	7½
Mutlah River, (entrance to Biddah River), Bay of Bengal, W. Coast.	10 0	14		Needles Point, England -	9 46	7½
Mutlah (Muda Kali), Bay of Bengal, West Coast.	11 45	15		Negapatam, B. of Bengal	5 0	3
Mutton Island, Ireland, W. Coast.	4 20	13½	9½	Negro Harbour, Nova Scotia.	8 12	7
Myggenæs Fiord, Færoe Islands.	9 0	9½	7½	Negro River, Patagonia	11 0	14
Naafe R., Bay of Bengal, E. Coast.	10 0			Nelson, New Zealand -	9 50	14
Naalsøe Fiord, Færoe Islands.	4 0	6½	4½	Neuf Port, Gulf St. Lawrence.	2 10	13
Nafa-Kiang, Loo Choo Islands.	6 28	7		——, River St. Lawrence.	8 30	14
Nagasaki Bay, Japan Sea.	7 15	9	7½	Neville Port, Vancouver Id.	0 30	17
Nagore, Bay of Bengal, W. Coast.	8 15			New Bedford (entrance), United States.	7 57	4½
Namki Ids., China, East Coast.	8 30	17		—— Castle, United States	11 53	7
Namoa Island (Clipper Road), China, E. Coast.	11 15	7		—— Haven, United States	11 16	6½
Namquan Harb., China, E. Coast.	10 0	17		—— London, United States.	9 28	3
Nanaimo Harb., Gulf of Georgia, Vancouver Id.	5 0	14		—— Providence, S. W Bay, Bahamas.	7 30	4
Nancowry Harb., Nicobar Islands.	9 15	8½		—— Rochelle, United States.	11 22	8½
Nangamessie Harbour, Sumba.	11 30	17	13½	—— Ross, Ireland -	6 4	12½
Nangka Id., Banka Strait		12		—— Year Sound, Tierra del Fuego.	3 30	
Nanoose Harbour, Van- couver Id.	5 0	15		—— York, United States	8 13	5½
Nansaree River (Bar), Hindoostan, W. Coast.	3 0	18		Newburyport, United States	11 22	9
Nantucket, United States	12 24	3½	3	Newcastle, Australia, E. Coast.	9 45	6-7
Napoleon Road, Gulf of Tartary.	2 30	2½		—— England -	4 23	10½
Narrinda Bay, Mada- gascar, W. Coast.	4 30	15		—— Ireland -	10 30	16
				Newhaven, England -	11 51	20
				Newport, United States -	7 45	4½
				—— Wales, (South Coast.)	7 10	39
				—— (W. C.)	7 0	12
				New Quay, Wales -	7 30	15
				Newton Stewart, Scot- land, W. Coast.*	12 0	12

* At Carty Quay.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neaps.			Spring.	Neaps.
	h. m.	ft.			h. m.	ft.	ft.
g Bay, China, east.	8 30	5½		Nyminde Gab, Jutland -	2 41	2	
, St., Harb., G. Lawrence.	1 55	12	7	Nysna Harbour, Africa, S. Coast.	3 45	6	
— Port, Peru	5 15	3		Oban, Scotland - -	5 22	12	9½
n Port (Lambton	4 30	5	3	Obb of Harris, Isle of	6 16	11½	8½
ur) New Zealand.				Harris, Scotland.			
Id. (Nancowry	9 15	8½		Observatory Id., China	11 0	5½	
, Indian Ocean.				Sea, E. Coast.			
St., Bay, Ma-	2 6			Ocracoke Inlet, United	7 4	2½	2
Strait.				States.			
Gulf (Port Her-	3 9	10		Octavia Bay, New	3 30	13	
), Cent. America.				Granada.			
, Belgium -	12 18	16	13	Oelar Cape, Banka Strait	6 30	12	
iep, Netherlands	7 27		3½	Obo Sima, Loo Choo Ida.	7 30	5½	
iver (Nun en-	4 8	6		Oibo Harb., Africa, E.C.	4 15	6	
), Africa, W. Coast.				Olaveaga, Bilbao River,	3 15		
i Chan., White	5 25	3		Spain.			
- Twr., White Sea	6 0	2		Old Pt., Comfort, United	8 17	3	2½
Sound, China,	10 30	20		States.			
st.				Old Providence, Bay of	irr.	1	
Group, China E.	10 0	5		Honduras.			
, Yellow Sea -	12 0	6		Olenj Islands, Lapland -	7 30	12	
u, Yang River,	1 0	9		Oleron, Ile d' France -	3 50	19	
E. Coast.				Omaider Island (Gulf of	6 0	4	
r, America, N.W.	6 0	18	15	Akabah), Red Sea.			
aland, Scotland	5 2	11½	7	Omersary R., Hindoostan,	1 45	18	
y of Fundy -	12 41	50½	43½	W Coast.			
und, Tierra del	2 30	5		Omonville, France -	7 29	15½	12½
tier, France -	3 2	16	11½	"Om-rasas-Masirah,	10 0	10	
Port, Africa,	2 30	5½		Arabia, S.E. Coast.			
Coast.				One Fathom Bank Light,	6 0		12
Sound, Vancou-	12 0	12		Malacca Strait.			
l.				Onega River, White Sea	9 17	6-7	
ey, Germany -	10 30	8		Ooloogan Bay, China Sea,	9 30	5½	
gland -	12 30	15½		E. Coast.			
Island, S. Pacific	7 45	7		Oonting Port, Loo Choo	6 35	8	
pe, C. Breton Id.	8 0	4		Islands.			
— Edisto River,	7 10	7	5½	Oosima, Japan Sea -	6 50	5	
l States.				Oporto, Portugal - -	2 30	10	
harbour, New-	8 0	7½	5	Orange B., T. del Fuego	3 30	5	
and.				— Cape, Magellan Str.	3 0		
lands, Malacca	5 30	15	12	Orford Haven (Bar), Eng-	11 30	7½	
				land.			
nd, Madagascar	5 0	15		— Port, California -	11 26	6½	4½
mbala Harbour,	6 36	10		— Quay, England -	12 30	7½	
d.				Orfordness, England -	11 15	8	6½
e Inlet, Van-	12 0	12		Orinoco River (entr.)	6 0	3	
Id.				Guayana.			
Gulf, Patagonia,	7 0	10		Orleans Id., R. St. Law-	5 40	17	
st.				rence.			
Port, Central	3 10			Ormond, Kenmare River,	3 43	IV	7½
ca.				Ireland.			
Port, Fijii Ida.	6 47	5½		Ornsay, I. of Skye -	5 50	14½	10½
oa, Comoro Ida.	3 0	14		Orlov Letni C., White	5 18	4	
iver, Africa -	10 0	15	11½				
				Oa Ilheos, Brazil -	4 30		
				Osaki, Japan Sea -	5 55	6½	
				Oscuro Cove, Patagonia,	0 55	20	
				W. Coast.			
				Osprey Reef, Australia,	8 36	6	
				E. Coast.			

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Noaps.			Springs.	Noaps.
		ft.	ft.			ft.	ft.
Ostend, Belgium -	12 25	19	15	Patteson Port, Vanu Lava	6 40	5	
Otago Har., New Zealand	2 50	7	5	Id., Banks Ids.		8	
Otaheite, South Pacific -	noon	1½		Paul de Loanda, San,	4 30	5	
Otterswick, Orkneys -	9 13	11	8	Africa, S.W. Coast.			
Otway Port Patagonia,	11 37	6		Paul St. Id., Indian Ocean	11 0	3	
W. Coast.				— G. St. Lawrence	8 0	3	4
On ou Kinsh Inlet, Van-	12 0	12		Paumben Pass, Bay of	1 30	2	
couver Id.				Bengal, W. Coast.			
Ounalashka Id., America,	7 30	7½		Payta Port, Peru -	3 20	3	
N.W. Coast.				Peckett Har., Magln. Strt.	12 0	6	
Ouro R., Africa, W. Cst.	12 0	8-9		Pedro Gonzales, New	3 50		
Ouse, R. (Goole), England	7 44	14		Granada, (Trapichi			
Ower Shoal, England, E.C.	6 30			Island).			
Oxbaasheia, Svee Fiord,	12 0	8		Pedro San., Pass, Patagonia.	0 30		
Norway.				W. Coast.			
Oyster Bay, United States	11 7	9½		— San Bay, California	9 39	4½	3
Oystreham, France -	9 38	21	16	Peel, Isle of Man -	11 8	16½	13
Packsaddle Bay, Tierra	3 30	6		Pegasus Port, New Zealand	11 50	8	6
del Fuego.				Peh-tang-ho, Yellow Sea	3 33	10	7½
Padstow, England -	5 13	20½	16½	Pei-ho or Peking River	3 40	10	7½
Pagham (entrance),	11 30	16½	12½	(entrance), Yellow Sea.*			
England.				— (Tien-tsin)	7 0	4½	
Paimpol, France -	6 0	31	23½	Pelew Islands, N. Pacific		6	
Palais, Port le, Belle Ile,	3 18	14½	10½	Pelican Lagoon, Kangaroo	5 0	6	
France.				Id., Australia.			
Palliser Cape, New Zealand	6 0	6		Pelorus Sound, New	9 33	11	7
Palma, Canary Ids. -	12 30?	9?		Zealand.			
Palmas Cape, Africa, W.	4 30	4		Pemba Channel, Mozam-	4 0	11	
Coast.				bique.			
Palmedo Road, Sumba Id.		15		— Id., Mozambique	4 15	13	
Palmeira Point, Ceylon -	9 30	7-11		Pembroke Dockyard,	6 12	21	15½
Paloan Bay, Mindoro -		5		Wales.			
Pamarung Ids., Borneo,		8-10		Penang, Malacca Strait -	12 0	9	7½
E. Coast.				Peñas Cape, Tierra del	6 2	12	
Pampang Bay, Java -		7-8		Fuego.			
Panama Road, Central	3 23	15-22	10-16	Pender Harb., Strait of	6 0	13	
America.				Georgia, B. Columbia.†			
Pancol, China Sea, E.C.	9 40	6		Peniche, Portugal -	1 54		
Pansand Hole, England -	12 0	15½	13	Penmark Rocks, France	3 16		
Paposo, Chile -	9 40	5		Pennington R., Bight of	4 15	5	
Paquique Cape, Bolivia -	9 45			Benin.			
Para, Brazil, N. Coast -	12 0	11		Pensacola, G. of Mexico		1½	
Parahiba, Brazil -	5 0	9-12		Pentillie, R. Tamar,	5 55	13½	9½
Paranga-ranga Harbour,	7 54	7		England			
New Zealand.				Pentland Firth, Stroma,	9 47	9	6½
Parida Id., New Granada	3 15	10½		S. Side.			
Pariboro, Bay of Fundy	12 17	43	37½	— Swona, E. Side	10 24		
Pasado Cape, Ecuador -	3 30	10		— W. Side	9 35		
Pasages Port, Spain -	3 0	12	9	— Great Skerry,	11 4	9½	6
Passage or Culebra P.,	9 0	1		E. Side.			
Caribbean Sea.				— W. Side	10 53		
— Id., Banda Sea -	noon	6		Penzance, England -	4 30	16½	12½
Passandava Bay, Mada-	5 0	15		Percy Isles, Middle or	10 30	16	13
gascar, W. Coast.				No. 1 Id.			
Patapasco R. (Bodkin Pt.)	5 42	1½	1	— South or	10 30	14	
United States.				No. 2 Islet, Australia,			
Patersons Inlet, New	1 10	5	6	E. Coast.			
Zealand.				Perim Id., G. of Aden -	12 0	7	
Patrick Port, Scotland -	11 10	15	12	Pernambuco, Brazil -	4 45	6-8	
Patta B., Africa, E. Cst.	4 30	10		Peros Banhos, Indian	1 30	5	
				Ocean.			

* Time and rise much affected by winds.

† From observations made in the month of October.

	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
ait, Japan	10 30	6		Playa Marie Bay, Cali- fornia.	9 20†	7-9†	
arks Bay, W. Coast.	12 45	5½		Playa Parda Cove, Ma- gellan Strait.	1 8		
-	3 35			Pleasant Port, Falkland Islands.	5 0	6½	
exico, W.		7		Plettenberg Bay, Africa, S. Coast.	3 10	6	
(Makung a Sea.	10 30	9½	7	Ploughrescan, France -	5 17	25½	18½
C. Breton	7 30	6	4	Ploumanach, France -	5 15	24½	18½
., Prince id.	8 30	4	2½	Plumper Cove, Howe Sound, G. of Georgia, British Columbia.*	noon.	12	
land -	0 34	10½	8½	Sound (Fane Id.), Vancouver Id.	irr.	12	
l. of Fundy	10 41	22	18	Plymouth Breakwater, England.	5 37	15½	11½
f Islands, id.	10 42	5½		----- (Sutton Pool)	5 32	15½	11½
t. Francis a, S. Coast.	12 0	6		----- United States	11 19	11½	10½
Patagonia,	0 50	16		----- New, New Zealand.	9 30	12	
t, Wusung	0 35	18	8	Pomba B. Africa, E. Cst.	4 0	15	11
t, E. C.				Pomquet, Nova Scotia -	9 15	4	2½
J. States -	1 18	6½	5½	Ponga River, Africa, W. Coast.	7 30	12	9½
side, Ma-	9 30	24		Poolbeg Lt. Hse., Ireland	11 12	12-14	9-11
apel Bay, Coast.	2 30	3-4		Poole, England -	{ 9 10 12 45 }	{ 6½ 4½ }	
entrance, Coast.	1 30	3-4		Poolewe, Loch Ewe, Scotland.	6 39	14½	10½
Lucenscliff	1 30	3		Pootoo Island, China, E. Coast.	8 15	12	
bson Bay, Coast.	3 0	3-4		Poqueldon Harb., Pata- gonia, W. Coast.	0 54	18	
.. (Cherry ted States.	10 5	■	4	Portaferry, Ireland -	12 0	18-21	12-16
ay, Chile -	9 20	5		Port-au-Choix, Newfound- land.	10 47	5	
ova Scotia	10 0	6	4	Port au Prince, Saint Domingo.	8 0†	1†	
ombock -		10-12		Port-en Bessin, France -	8 57	20	15½
England -	11 5	28	21	Portchester, England -	11 46	13½	10½
wfoundland	8 33	6½	4½	Portendik, Africa, W. C.	10 0	6	
China Sea,		4		Porth Cawl, Wales -	6 8	28½	21½
ellow Sea	11 45	8		Porth-dyn-lleyn, Wales	8 30	16	
, China, E.C.	8 30	17		Portishead, England -	7 16	41½	31
gellan Strt.	1 0			Portland Inlet (Salmon Cove) America, N.W. Coast.	1 8	16	
Tasmania -	1 0	6		----- United States	11 25	10	8½
. Lawrence	5 0	17	10	----- Bay, Australia, S. Coast.	Midnight.	4	
., Africa,	4 30	12		----- Breakwater, England.	7 1	6½	4½
ew Granada	3 15	14		Porto Frio, Brasil -	2 40	4½	
ell River,	12 20	12		Porto Praya, C. Verde Ids.	6 0†	5	
ort, Babu-	6 0	6		Portree, Isle of Skye -	6 32	15	10½
ru -	4 50	4		Portrieux, France -	6 0	■	23½
Patagonia,	12 23	10		Portsbridge (Portsmouth) England.	11 48	6½†	4
stan, W. C.	10 5	9		Portsmouth Dockyard, England.	11 41	12½	10
wfoundland	9 15	8					
a, Cuba -	7 31	2½					

Observations made in the month of October.

† Above the bed of the lake.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Portsmouth, United States Possession Bay, Magellan Strait.	11 23 9 0	10 36-42	8½	Puna Island, Ecuador -	6 0	11	
— Cape, Torres Strait.	9 0	6		Pwlheli, Wales -	7 46	13½	9½
— Id., Torres St.	1 0	9½		Quaco, Bay of Fundy -	11 35	30	25
Post Office Island (Charles Island), Galapagos.	2 10	6		Quatsino Sound, Vancouver Id.	11 0	11	
— Id., Torres Str.	1 0	9½		Quebec, R. St. Lawrence	6 38	18	13
Pouinipet Island, Caroline Islands, N. Pacific.	6 0	4½		Queda, Malacca Strait -	12 0	5½	
Poulamente B., Madame Id., C. Breton Id. -	7 50	6	4	Queen Charlotte Sd. (entrance), New Zealand.	8 50	8	6
Poulton-le-Sands, England	11 26	27½	21½	Queensferry, Firth of Forth, Scotland.	2 37	18	14
Poverty Bay, New Zealand	6 5	6		Queenstown, Ireland -	5 1	11½	9
Pratas Shoal, China Sea	4 0	5		Quelan Cove, Patagonia, W. Coast.	0 28		
Preservation Inlet, New Zealand.	11 20	8	6	Quentin, Port San, California.	9 5	9	
Preston, England -	11 49	10	4½	Quicavi Bluff, Patagonia, W. Coast.	0 57	20	
Prince Frederick Harb., Australia, N.W. Cst.	12 0	28		Quicks Hole (S. side), U.S.	7 36	3½	3½
Prince of Wales Strait, Banks Land.		3		— (N. side) -	7 31	4½	3
Princes Id., Bight of Biafra	3 45	4½		Quilca River, Peru -	8 0	6	
Princess Royal Harbour, Australia, S. Coast	11 56	1-4		Quilimane R. (entrance), Africa, E. Coast.	4 15	16	
Prony Bay, New Caledonia.				Quillebœuf, France -	10 6	9½	7½
Provincetown, U. S. -	11 22	10½	9½	Quiloa, Africa, E. Coast	4 45	12	
Pubnico (Beach Point), Bay of Fundy.	9 25	12	10	Quoile Quay, Strangford, Ireland.	12 45	11	9½
Puerto Bueno, Patagonia, W. Coast.	1 40			Rabat, Africa, W. Coast	1 46	9-12	
Puerto de Baitiqueri, Cuba.	9 7	2½		Race, Cape, Newfoundland.	7 0	6½	5
Puerto de la Luz, Gran Canaria, Africa, W. Cst.	12 52	10		Rachada Cape, Malacca St.	5 30	13	
Puerto de Maravi, Cuba	7 56	2½		Radama Port, Madagascar, W. Coast.	4 40	13	
Puerto de Mata, Cuba -	6 49	2½		Ragged Id., Sumbawa, Java Sea.	8 10	3	
Puerto de la Plata, St. Domingo.	7 30	3?		— Point, Borneo, E. Coast.		7	
Puerto de Taco, Cuba -	8 49	2½		Raine Id., Torres Strait	8 10	10	
Puget Sound (Nisqually), America N.W. Coast.	6 0	18	15	Rajahpoor Harb., Hindoostan, W. Coast.	11 0	12	
Pugwash Har., Nova Scotia	10 30	7	4	Rajang River, Borneo -	4 45	13	9
Pulaski Fort, United States	7 20	8	7	Ramos R., Bight of Benin	4 20	5	
Pulicat Shoals, Coromandel Coast.	9 25	2½		Ramree Road, Bay of Bengal, E. Coast.	10 0	12	
Pulo Aor, Sumatra, N.E. Coast.		5		Ramsay Sound, Wales -	6 0	17	
Pulo Condore, China Sea, West Coast.*	2 30	6½		Ramsey, Isle of Man -	11 12	19½	16
Pulo Leat, Gaspar Strait	2 30	4		Ramsgate, England -	11 44	15	12
Pulo Mendanao, Gaspar Strait.	2 30	4		Ramso Fiord, Norway -	10 45	7	
Pulo Panjang, G. of Siam	7 0	2		Rangoon, Bay of Bengal, E. Coast.	5 30	21	14
Pulo Timoan (W. side), China Sea, W. Coast.	6 0	7½		— R. (entrance) B. of Bengal, E. Coast.	3 15	21	14
Puluqui Id., Patagonia, W. Coast.	1 5			Raoul or Sunday Island, S. Pacific.	6 0	5	
				Rappahannock (Saunders Wharf), United States.	3 2	2½	2
				Rás Hafún, Africa, E. C.	6 15	4	
				Rás Jerdaffoon. See Guardafui Cape.			
				Rás Mohommed (Gulf of Akabah), Red Sea.	6 0	5	

* From a French survey, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Yemen, Arabia, East.	9 0	8		Rivadeo, Spain, N. Coast	3 0	15	
Yemen, Persian	11 45	7		Rivoli B., Australia, S.C.	10 0	4	
Yemen, Arabia {	8 30	5½		Rocas, As, Atlantic	5 15	10	
Yemen, S. E. {	10 0	10		Roche Cape, R. St. Lawrence	9 30	6	4
Yemen, Coast {	9 30	9		Rochefort, France	4 6	17	13
Yemen, Ireland	5 42	12½	9	Rochelle, France	3 31	17	13
Yemen, G. of Cambay,	2 15	18	13	Rockport, United States	10 57	10½	■
Yemen, W. Coast.				Rockall, N. Atlantic	3 30	12	
Yemen, America	3 6	11		Rocky Id., G. of Siam	4 0	4	
Yemen, Inlet, Pata-	0 44	14		Rodrigue Id., Ind. Ocean	1 45	6	
Yemen, V. Coast.				Romania Point (Malay	10 30		
Yemen, Ceylon, South	2 20	2½		Penin.), China Sea,			
Yemen, (Pier), Ireland	10 31	4	4	W. Coast.			
Yemen, Labrador	7 45	3½	1½	Romdals Ids., Norway	10 45	6	
Yemen, Burian Strait	5 0	10½		Rona (South) Light,	6 20	14½	10½
Yemen, England	{ 10 42	{ 8½	6	Scotland.			
Yemen, ve. Bass Strait	12 5			Roodewall Bay, Africa,	2 30	6½	
Yemen, France	6 20	35	26	S.W. Coast.			
Yemen, Iceland	5 0	17½	13½	Roque, Cape St., Brazil		10	8
Yemen, s Id., Borneo,		8		Roscoff, France	4 46	23	17½
Yemen, East.				Rosel, Jersey, English	6 13	30	21½
Yemen, Denmark	7 42	4		Channel.			
Yemen, Clyde, Scot-	1 15	9		Roshnoff Cape, America,	7 30	15	
Yemen, B., Marquesas	2 30	4		N.W. Coast.			
Yemen, Port, Tanna Id.	5 35	3		Rota, Spain	1 24	12½	■
Yemen, (St. Pierre)	noon.	3½		Rotterdam, Netherlands	3 45	7	
Yemen, (St. Denis)	0 22	2½		Rouen, France	2 28		
Yemen, (St. Gilles)	1 0	2½		Longe Harbour, New-	7 07	2-47	
Yemen, (St. Paul)	1 7	4		foundland.			
Yemen, Fiji Islands.				Roundstone, Ireland	4 28	13½	10½
Yemen, San Port.				Revama River, Africa,	4 0	16	11½
Yemen, Strait	10 0	7	5	E Coast.			
Yemen, Lighthouse, Eng-	10 51	24	17	Royal Harbour, Ruatan,	7 45	3½	
Yemen, R., Gulf St.	3 30	4	2½	Bay of Honduras.			
Yemen, United States	4 28	3½	2½	Royal Island, Bahamas	7 45	3½	
Yemen, Harb., Prince	6 0	3	2	Royal Port, Jamaica	11 0	1	
Yemen, Island.				Royalist Port, Palawan,	11 07	6½7	
Yemen, Australia, E.C.	9 20			E. C.			
Yemen, Plata, Cape	8 30	2		Royan, France	3 38	13½	10
Yemen, — Buenos	12 0	3-5		Ruapuke Id. (Foveaux St.)	1 0	8	6
Yemen, — Barragan	7 0	5-9		New Zealand.			
Yemen, America, E. C.				Rugged Id., Bahamas	8 0	3	
Yemen, le do Sul,		1½-2		— Nova Scotia	7 59	7½	6
Yemen, Brazil	3 0	4	3	Ruggles B., Falkland Ids.	7 30	5	
Yemen, Patagonia,	11 0	14		Rush Port, Ireland	6 8	5½	3½
Yemen, Africa, West	10 0	15	11½	Rutland Id., Ireland, W.	5 22	11	8
Yemen, R., Campbell-	4 0	10	7	Coast.			
Yemen, St. Lawrence.				Ryde, England	11 20	13½	
				Rye Bay, England	11 20	22	17½
				Sabine Pass, G. of Mexico		1½	
				Sable Cape (Clam Point),	8 27	8½	6½
				B. of Fundy.			
				— (Clarkes Harb.),	8 58	11	■
				B. of Fundy.			
				Sable Island, N. side,	7 30	4	
				Nova Scotia.			
				Sable Island, S. side,	6 30	4	
				Nova Scotia.			
				Sables d'Olonne, Les,	3 26	14	10
				France.			

io de la Plata the rise is greatly influenced by the winds, the water being raised by S.E. pressed by those from N.W., causing at Buenos Ayres a difference sometimes of 12 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Saboga, New Granada -	4 9	14		Sandy Hook, United States	7 29	5½	5
Sabon Id., Durian Strt. -		10		— Id., Madagascar, W.C.	6 0	15	
Sacred Bay, Newfoundland	7 23	2½		Saug-tau Bay, Yellow Sea.	0 55	7	4½
Sacrificios Pnt., Mexico, W. Coast.	8 15	■		Sanguanga (entrance) Ecuador.	4 10	9	
Saddle Id., East, China, E. Coast.	11 0	14		Sanguir Island, Moluccas		6	
Sado (Yebisu), Japan Sea	5 0	2		Sangwin R., Africa, W. Cst.	5 15	4	
Saguenay, Chicoutimi, G. St. Lawrence.	4 11	12	8	Sanmoon Bay (St. George Island), China, E. Coast.	10 20	15	
Saguenay, Tadoussac, G. St. Lawrence.	2 45	17	10	San-shui, Si Kiang, China, E. Coast.		5-6	
Saigon (C. St. James) -	11 0	8		Santa Catalina Id., California.	9 35?	5?	4?
— (Saigon City), Cochin China.	5 30	9½		Santa Cruz R., Patagonia, E. Coast.	9 30	40	29
Saintes, Caribbean Sea -	6 45			Santa Cruz or Agadir, Africa.	12 45	■	
Sal, C. Verde Ids., Africa, W. Coast.	7 45	5		Santa Island, California	9 35?	5?	4?
Salango Id., Ecuador -	12 41	12		— Tenerife, Canary Is.	1 30	8	
Salcombe, England -	5 41	15	11½	Santa Maria Island, Chile	10 20	6	
Saldanha B., Africa, W.C.	2 0	6		Santander, Spain -	3 30	15	12
Sale Macowa, Red Sea -	0 30	2		Santiago de Cuba, Cuba	8 33	2½	
Salem, United States -	11 13	10½	8	Santona, Spain -	3 30	12½	10
Salm R., Africa, W. Cst.	8 10	6		Saparooa Id., Moluccas -		6	
Salmedina Rocks, Spain	1 27	12½	8	Sapie Bay, Sumbawa -	1 0	10	
Salomon Ids., S. Pacific	6 45	2		Sarawak R. (Moratabas entr.)	4 0	9	3
Saltash, R. Tamar, England.	5 45	15	11	— Santubong (entr.)	4 0	10	1
Salt Cay Anchorage, Bahamas.	8 15	4	3	— Sarawak Junction	5 0	15-18	1
Saltees, St. George's Channel.	5 40			— City -	5 20	15-18	1
Salvador, San, Port, Falkland Islands.	8 10	8		Borneo, W. C.			
Samanco B., Peru -	6 30	2		Sarn Badrig or the Causeway, Wales.	7 30	13	
Sambilanga, Malacca St.		12	10½	Sarn-y-bwch Reef, Wales	7 40	14	
San Francisco (North Beach), California.	12 6	4½	3½	Sau-o Bay, Formosa -	10 0	3½	
San Bartholomew Port, California.	9 10?	7-9?		Saugor Id., B. of Bengal		12	
San Blas, Mexico, W. C.	9 41	6½		Saumarez Reef, Australia, E. Coast.	8 0	6	
San Juan (anchorage), California.	9 40?	■		Savannah (city), U. S. -	8 13	7½	
— del Sur, Central America.	3 8?	10?		— (entrance,) U.S.	7 20	8	
— River, New Granada -	6 0	12		Scales Point, Blackwater River, England.	12 0	14½	■
San Lucar, Spain -	1 53	12½	8	Sealloway, Shetland -	9 30	5½	
San Miguel, California -	9 25	5	4	Scarborough, England -	4 11	15½	1
San Rosa Id., California	9 30?	5?	4?	Scarcies Rivers, Africa, W. C.	7 10	10	
Sand Cay, United States	8 40	2	1	Scarnish, Tiree Id., Scotland.	5 31	11½	
Sandalwood Bay, Fiji Id.	6 0	6?		Scilly (St. Agnes Id.) -	4 30	16	1
Sand Point, G. of Liautung, Yellow Sea.	4 50	7	5½	— (St. Mary Id.), England.	4 27	16	1
Sands Pnt., United States	11 13	9	7½	— Trescow -	4 22	16½	1
Sandwich Port, Malicolo Id., Banks Id.	5 30	4		Sea Bear Bay, Patagonia, E. Coast.	12 45	20	
Sandy Cape, Australia, E. C.	7 50	6-8		Seaforth Loch, Athline, Scotland.	6 16	■	1
— Cove, E., B. of Fundy	10 33	21½	17½	Seaham, England -	3 24	14½	1
Sandy Cove, W., Bay of Fundy.	10 47	23	19	Seal Cove, Grand Manan, B. of Fundy.	10 54	20	1
				Seal Id., C. Sable, Bay of Fundy.	9 49	12½	1

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Bay, Mulroy	6 44	7½		Sheerness, England -	0 37	16	13½
nd.				Sheet Harb., Nova Scotia	8 6	6½	4½
San, Brazil -	2 0	4		Shefeen Island, Africa, S. C.	4 40	12	
Terra del Fuego	7 0			Sheffield Island, U. States	10 58	8½	7½
Spain, N. Coast	3 0	12	9	Shelburne, Nova Scotia -	8 4	7	5½
Bay,* Hin-				Sheldrake Island, Gulf	6 0	5	3
W. Coast.				St. Lawrence.			
China Sea, W. C.	9 44	7		Sherbro R., Africa, W. Cst.	6 0	11	
de, France -	3 21	17½	12	Shields, North, England	3 23	13½	10
ay, Lapland -	7 9	9		Shihtau Bay, Yellow Sea	1 30	9	7
, England -	11 45	16½	12½	Ship Harb., Nova Scotia	7 54	6½	4½
o Bay, Gulf of	2 0	12		(New Id.),	10 30		
, America,				Falkland Islands.			
onst.				Shippigan, Gulf St.	3 42	5½	3
Bar) -	8 42	6		Lawrence.			
et N'dar) -	8 42	6		Shoal Bay, Australia, N. C.	6 0	18-25	14-20
. Louis), Africa,	10 0	6		E. Coast -	8 30		
st.				Shoal Water B., Australia,	10 30	12-18	
ank Mosquito		2		E. Coast.			
Bank, Mosquito	irr.	2		Shoreham, England -	11 34	■	13½
				Shushartie Bay, Vancouver		12	
ands, Hang-chu	11 45	14		Id.			
ina, E. Coast.				Si Kiang or West River,			
ortugal -	2 30	8	11½	China, E. Coast:			
ver, (entrance,)	3 31	15		" (San-shui) -			5-6
				" (Shao-king) -			3
				" (Wuchan) -			1-1½
Archip. (Mayhé	4 0	6½		Sink River, Malacca Strt.	9 0	12	
in Ocean).				— off the town -		11	
, Ladrone Ids.	6 45	2½		Sidmouth Cape, Australia,	9 15	10	
nds, Lapland -	8 20	12	5	E. Coast.			
Bay, Gulf	1 40	9		Sierra Leone, Africa, W. C.	7 55	8	
rence.			8	Sillehar R. (Bar), Sumatra	6 0	4½	
n Banks (west	2 50	10		Simidsu, Japan Sea -	7 30	7	
ellow Sea.				Simoda Port, Japan Sea	5 0	3-5	
dún, Arabia,	9 20	10		Simonoseki, Japan Sea -	8 30	8	6
ant.				Simons Bay, Africa -	2 44	5½	3½
ifeh, Arabia,	9 45	10		Simons St. Island, U. S.	7 43	8½	6½
ast.				Singapore, New Harbour,	9 45	10	7½
arb., Falkland	9 30	6		Malacca Strait.			
			7	Sinou, Africa, W. Coast -	5 0	4	
ang-tse-Kiang,	0 40	10		Sir C. Hardy Ids., Torres	9 15	10	
S. Coast.				Strait, E. Coast.			
Si Kiang,		3		Sir E. Pellew Islands,	7 30	4-7	
S. Coast.				Australia, N. Coast.			
rsian Gulf -	1 0	6		Sisal, Gulf of Mexico -		2	
y, Naturaliste	11 45	6		Sitka, America, N. W. C.†	0 34	5-7	
				Skaapen Fiord, Færø			
- Denham Sd.	12 5	5		Islands:			
- Freycinet	3 0	5		Between Stormoe and	5 0	9½	7½
				Sandoe.			
- Freycinet	4 15	3½		Between Hestoe and	5 30	9½	7½
				Sandoe.			
- Cape Perron	12 45	5½		Skagen or the Skaw,	5 56	1	
- Hamelin Pool	5 0	3½		Jutland.			
- Australia,				Skerry, Great, E. side,	11 4	9½	6
N. W. Coast				Pentland Firth.			
harbour, New	1 0	4	2	Skerry, Great, W. side,	10 53		
ck.	8 0			Pentland Firth.			
n, Ireland -	5 32	11½	8½	Skerries, Ireland, N. Cat.	6 15	5	3

des rise a.m. 6 feet, p.m. 7½ feet from October to March; and the contrary during the rest of

at Sitka as given by Commander Pearce, H.M.S. Alert, in his remarks in 1860, does not
t, but on the authority of Commander Pike, H.M.S. Devastation, (1862,) the local phenomenon
sometimes is as much as 16 feet.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Skerries, E. Coast. -	11 0	13	10	Steilacoom Fort, Oregon	4 46	11	9½
Skip Ness, Scotland -	11 50	9		Stephen Port, Australia, E. Coast.	9 0	6	
Skull, Ireland -	4 2	9½	7½	----- Falkland Islands.	7 45	7½	
Slaughden, Orford, England.	1 0	7½		Stewart Harbour, Tierra del Fuego.	2 50	4	
Slievebane Bay Ireland, W. Coast.	5 49	10½	7½	Stirling, Firth of Forth, Scotland.	3 52	7½	4½
Sligo (Bay), Ireland -	5 18	11½		Stirrup Cays, Bahamas -	7 0	4	
----- Harbour, Ireland	5 23	11½	8½	Stockton (Tees), England	4 40	11	
Slyne Hd., Ireland, W.C.	4 30	13½	10	Stonefield (Loch Etive), Scotland.	7 3		
Smalls Lighthouse, St. Georges Channel.	6 0	21		Stonehaven, Scotland -	1 10	14	11
Smerwick, Ireland -	3 50	11½	8	Stonington, United States	9 7	3½	3
Smithville, United States	7 19	5½	4½	Stornoway, Lewis Island, Scotland.	6 46	13	9½
Smoky Bay, Australia, S. Coast.	12 15	6		Strangford (Killard Point), Ireland.	10 53	14	11½
Smyth Harbour, Tierra del Fuego.	12 0	6½		----- Quay -	12 31	10½	8½
Snape Bridge, Orford, England.	3 0	6		----- Head of Lough (Turley Rocks).	12 44	11½	9½
Socoa, France -	3 19	12½	8½	Streaky Bay (Blanchepoort), Australia S. C.	1 0	5	
Society Bay (Sullivan Bay), Yellow Sea.	0 15	8		Stroma, S. side, Pentland Firth.	9 47	9	6½
Socotra Id., Indian Ocean	7 20	8		Stromness, Orkneys -	9 0	10	7½
Sofala R., Africa, E. Coast	4 0	19		Suadiva Atoll, Maldives	1 0	4	
Solovet Road, White Sea	5 0	4		Sual Port, Luzon -		6	
Solway (Tarn Point), Scotland.	11 22	23	18	Suderoe Fiord, Færoe Ids.	6 0	9½	7½
Sosnovaia Bay, White Sea	2 40	6		Suez Bay (head of Gulf), Red Sea.	2 0	6	
Sosnovets, White Sea -	11 44	18		Sughrá, Arabia, S.E. Cst.	8 0	6	
Souma, White Sea -	6 30	5½		Sumburgh Head, Shetland	9 45		
South Farallon, California	10 37	4½	3½	Sunday or Raoul Island, S. Pacific.	6 0	5	
South Rock, Ireland	10 58	13	10½	Sunderland, England -	3 22	14½	11
Southampton, England -	{ 10 30	{ 13	9½	----- N., England -	2 30	15	11½
South West Bay, New Providence.	{ 12 45			Supé Bay, Peru -	4 50	3	
----- Cape, N. Zealand	7 30	4		Surat, Hindoostan, W. C.	4 0	19	
Southernness, England -	12 0	7	5	Surin, St., France -	4 11	14½	11
Southwold, England -	11 20	28		Surinam, Guayana -	6 0	5½	
Spain, Port, Trinidad -	10 20	6½	4½	Sussex Port, Falkland Ids.	8 15	6	
Spensers Anchorage, Bay of Fundy.	4 30	4	3	Sutton Pool, England -	5 32	15½	11½
----- Bay, Africa, S.W. Coast.	11 42	39	33	Sviatoi Nos, Lapland -	9 15	14	
Spenser Gulf, (Thorny Passage,) Australia, S. Coast.	10 50	5-6		Svineoe Fiord, Færoe Ids.	12 0	6½	4½
----- Point Lowly -	12 0	6-8		Swain Reefs, Australia E. Coast.	10 25	10	
----- Port Augusta* -	7 0	6-8		Swan Id., Bass Strait -	9 35	6	
----- Point Riley -	8 30	9-12		----- River, Port Grey, Australia, W. Coast.	9 0	1-1½	
----- Wallaroo -	5 45	4½		Swansea, (Mumbles Lighthouse), Wales.	6 1	27½	20½
Spicers Cove, B. of Fundy	irr.	4-5		Swift Bay, Australia, N. Coast.	12 0	21	
Spider Id., China, E. C. -	11 35	37	30½	Swona, E. side, Pentland Firth.	10 24	10	7½
Spitzbergen (Bell Sound)	10 0	17		----- W. side, Pentland Firth.	9 35	10	7
Spurn Pt. (Humber R.), England.	8 56	3½		Sydney, Australia, E. Cst.	8 38	4½	4
Staten Island, Tierra del Fuego.	5 26	18½	15				
Staunton Id., Yellow Sea	4 30	8					
	1 30	8	5½				

* At Port Augusta, when the winds veers round to West and South, and blows strong, the rise has been as much as 16 feet. Commander John Hutchison, R.N., Admiralty Survey, South Australia, 1862.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Harb., Cape Breton	9 0	5	4	Tavoy R., (entrance) Bay of Bengal, E. Coast.	10 30	20	
g ho Yellow Sea -	4 10	10½	8	Tay River (Bar), Scotland.	2 6	16	14
Bay, Africa, W. Cst.	2 40	5		Tay-bay-oo-bay, China Sea, E. Coast.	10 15	6	
R., Africa, W. Cst.	4 45	3-4		Tebonkos Road, Baly. (N. Coast.)	5 0	6½	
Island, S. Pacific		3		Teelin Harb., Ireland -	5 16	11½	8½
San, River, Pata-	11 45	6		Tees R. (Bar), England	3 45	15	
a, W. Coast.				Teignmouth, England -	6 0	13	9½
S. Pacific -	noon.	1½		Tenby, Wales - -	6 0	27	20
Persian Gulf -	5 0?			Tenerife, Cape Verd Ids., (Santa Cruz).		8½	6
o ho, Yellow Sea -	0 15	6		Terceira, Azores -	12 32	4½	
w Ids., China, E. C.	9 0	14		Teriberka R., Lapland -	7 20	12	
i Bay, China Sea,	9 30	5½		Terschelling (West), Netherlands.	8 40	6	5
oast.				Tetrina, White Sea -	3 17	7	
uano, Chile -	10 14	5		Tetuan, Africa, N. Coast	2 23	2½	1½
Island, Patagonia,	1 3	15½		Texel (outside Shoals), Netherlands.	6 30	4	3½
Coast.				Thirsty Sound, Australia, E. Coast.	10 45	12-18	
g Channel, Canton	1 30	6½		Thomas St., Id., Africa -	3 25	4½	
r, China.				Thompson Sd., New Zealand.	11 30	8	6
Whan Bay, Yel-	10 47	10½	8	Thorny Passage, Spencer Gulf, Australia, S. C.	12 0	6-8	
Sea.				Thorsminde, Jutland -	3 34	2	
no Ura Harbour,		6-8	4-6	Three Hummock Island (E. side), Bass Strait.	10 30	10	
Id., Japan Sea.				Three Kings Islands, New Zealand.	8 0	7	
Hui Harbour, China	11 45	7-12		Three Points Cape, Africa, W. Coast	4 0	4	
E. Coast.				Three Rivers, River St. Lawrence.	11 30	1	
R., George Town,	12 5	10	7½	Throgs Point, U. S. -	11 20	9½	7½
ania.				Thurso, Scotland - -	8 28	14½	11
R., Launceston,	1 0	12½		Ticao Island, (Port San Jacinto) Filipinas.	6 30	6	
ania.				Tictoc Bay, Patagonia -	1 45	11	
—Port, Magellan	3 5	5		Tien-pak Harb., China, East Coast.	12 0	8½	
it.				Timballier Bay, G. of Mexico.	irr.	2	
ave, Madagascar,	4 18	8		Tinghae, Chusan, China, E. Coast.	11 0	12	9
oast.				Tobago, Caribbean Sea -	irr.	3½	
Bay, United States	11 21	1½	1½	Tobermory, Isle of Mull	5 36	13	9½
, Ki Channel,	6 0	6	5½	Toboe Ali Point, Banka {	8 30PM* } 10 0AM†	12	
n Sea.				Strait.			
, Summer Islands,	6 37	14	10½	Tomo (Seto-uchi), Japan Sea.	11 0?		5
land.				Tongatabu, S. Pacific -	6 50	4	
r, Africa, N. Coast	1 42	8		Tongsang Harb., China, E. Coast.	11 30	12	
ing Harbour, Mada-	4 30	6		Tonning, Germany -	2 1	9	
ar, E. Coast.				Tooniang Id., Bias Bay, China, E. Coast.	8 0		
ig Api, China Sea		7					
ig Bolus, Malacca	9 30	10½	8½				
it.							
, New Hebrides -	5 35	3					
nannock, U. States	0 42	2	1½				
nooly Harbour, Su-	6 10	6					
a.							
aki or New Ply-	9 30	12	9				
th, New Zealand.							
t, Ireland - -	4 57	14½	10½				
, Spain - -	1 46	6	3½				
Pt., Solway, Scot-	11 22	23	18				
.							
ilin Cove, United	8 4	2½	2½				
es.							
own, United States	9 57	4	3½				
agouche, Nova	10 0	8	5				
ia.							
ma Bay, Japan Sea	5 50	5					
iga Harbour, New	7 10	6	4½				
and.							

* In S.E. monsoon.

† In N.W. monsoon.

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Springs.	Neaps.			Springs.	Neaps.
Topaze Harbour, British Columbia.	b. m. 3 0	ft. 16	ft. 11½	Turon R., Cochin China	h. m. 3 0	ft. 4	ft.
Torbay, England -	6 0	13½	10	Tuticorin Harb., G. of Manar, Bay of Bengal, W. Coast.	1 15	2½	1½
Toro Point, Chile -	9 45			Tutukaka Harbour New Zealand.	7 0	9	7
Tortola, Virgin Islands -	8 30	1½		Tweed River (Danger Point), Australia E. C.	9 45	5-8	
Tortugas, Florida, U. S.	9 56	1½	1	Twofold B., Australia, E. C.	10 0	7	5
Towan Id., China, E. C.	9 20	13		Tylatiap Harb. Java, S. C.	8 45	3½	
Tower Id., Galapagos -	?	?		Tynemouth (Bar), England	3 20	14½	11
Townshend Harb., Tierra del Fuego.	2 30	5		Typa Anchorage, China, E. Coast.	10 0	7	
Townshend Port, Oregon	3 49	5½	5	Uist North (Kallin), Scotland, W. Coast.	5 59	15½	8½
Tracadie, Prince Edward Island.	7 0	3½	2	— (Vallay), Scotland, W. Coast.	6 10	11½	8½
Tracey Harbour, British Columbia.	12 0	16	11½	— South. (Loch Boisdale), Scotland W. C.	5 47	12½	9½
Tracy Island, Korea, S. Coast.	8 58	11½	8½	Ullapool, Loch Broom, Scotland.	6 40	14½	10½
Træ Islands, Norway -	11 45	7		Ummen Nakheilab, Persian Gulf.	7 30?	8?	
Trawbreaga Lough, Ireland.	6 10	11½	8½	Underwood Port, New Zealand.	6 10	8	6
Tréguier, France -	5 32	25	18½	Union Bay, La Plata -	3 10	12	9
Trek Island, White Sea -	10 48	20		Union, Port la, G. of Fonseca, Cent. America.	3 15	10½	8½
Trepassey, Newfoundland	7 0	6½	5	Unsang, Borneo -	8 0	3½	
Tréport, France -	11 9	27	21	Upervivik, Greenland -	11 0	8	
Tres Cruces Point, Patagonia, W. Coast.	1 15	16		Upstart Bay, Australia, E. Coast.	9 0	6	
Triangles, Gulf of Mexico		1½		Urakami, Japan Sea -	7 30	6	5
Trincomale Har., Ceylon, S. Coast.	8 18	2	1½	Uranouchi, Japan Sea -			5
Tringano R., G. of Siam, China Sea, W. Coast.	8 0	7		Urie Firth, Shetlands -	9 45	6½	5
Trinidad (Port Spain), Caribbee Islands.	4 30	4	3	Ursula Id., Palawan, China Sea, E. Coast.	11 0	7½	
Trinity Bay (Bull Id.) Newfoundland.	7 22	3½	2	Ushant, France -	3 32	19½	13½
— Opening, Great Barrier Reef.	9 15	7-12		Ushruffi Islands, Red Sea	6 14	2	
Tristan d'Acunha, South Atlantic.		8		Utria, New Granada -	4 0	12	
Triton Harb., Newfoundland.	7 0?	2-4?		Værø, Norway -	12 0	9	7½
Tromsø, Norway -	1 45	8		Valdivia Port, Chile -	10 35	5	
Troon, Scotland -	11 50	10	7½	Valentia Harb., Ireland -	3 42	11	8
Troubridge Shoals, Australia S. Coast.	3 30	6		Valentine Harb., Magellan Strait.	2 0		
Truro, England (Town Quay).	5 5	10	6	Valery St. en-Caux, France sur-Somme,	10 46	27	21½
Tsang-chow Id., Bias Bay, China, E. Coast.	8 30			France.	11 46	27	21½
Tsau-liang-hai or Chosan Harb., Japan Sea.	7 45	7	5	Vallay, North Uist, Scotland, W. Coast.	6 10	11½	8½
Tsu-sima Sound, Japan Sea.	8 30	8	6	Vallenar R., Patagonia, W. Coast.	0 18	5	
Tsugar Strait, Japan Sea	5 0	5		Valparaiso, Chile -	9 32	5	
Tudwall, St., Road, Wales	7 45	14		Vansittarts Saddle, Yellow Sea.	4 20	10	8½
Tumaco Road, Ecuador -	2 33	12		Vao Port, Isle of Pines, New Caledonia.	8 6	4	
Tunis, Mediterranean -		3		Veere, Netherlands -	1 20	15	
Turna Bay, White Sea -	9 54	11		Ventry, Ireland -	3 44	10½	7½
Turner C., Prince Edwd. Island.	6 10	4	2	Venus Harbour, Australia, S. Coast.	2 16	6	

Place.	High Water, Full and Change.	Rise.		Place.	High Water, Full and Change.	Rise.	
		Spring.	Neap.			Spring.	Neap.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Vera Cruz, G. of Mexico		2		Wangari Harbour, New Zealand.	7 0	9	7
Vermilion Bay, G. of Mexico.	irr.	2½	1½	Wangaroa Harbour, New Zealand.	8 15	7	
Vernon Chan. (Chusan Arch), China, E. Coast	9 40	14		Wangaruru Harbour, New Zealand.	7 10	9	7
Versavah, Hindoostan, W. Coast.	12 15	16		Wapitagnu Harb., G. of St. Lawrence.	10 30	5	3
Verte Bay, Nova Scotia	10 0	9	5	Warleigh Quay, River Tavy, England.	5 47	14½	10½
Victoria Port, Brazil -	3 0	4		Warnboro' Sd., Australia, W. Coast.		3-4	
— St. Juan de Fuca Strait.	irr.	7-10	5-8	Warrenpoint, Carlingford, Ireland.	11 10	14½	12
Victoria R., Mosquito Flat, Australia, N.W. Coast.	12 19	15-24		— Lough Foyle, Ireland.	6 20	6½	5
— Sandy Island, Australia, N.W. Coast.	1 17	3-10		Warsheek Roads, Africa, E. Coast.	4 30	8	
— Turtle Pt., Australia, N.W. Coast.	7 15	7-13		Watch Hill, United States	9 0	■	2½
Vigo, Spain - - -	3 0	12-13		Waterford (Bridge), Ireland.	6 6	13½	10½
Vila Harb., Sandwich Id., Banks Ids.	5 0	5		Waterford (Duncannon Fort).	5 20	12½	10
Vin Harbour, G. St. Lawrence.	5 45	5	3	Waterloo B., Africa, S. Cat.	4 0	6	
Vincent, St., Cape, Madagascar, W. Coast.	4 45	12		Week Islands, Tierra del Fuego.	2 0	5	
— Port St., New Caledonia.	5 50	4½		Wei-hai-wei Harbour, Yellow Sea.	9 30	9	
Virgin C., Magellan Strait.	8 30	36-42		Weir Head, R. Tamar, England.	6 17	5½	1½
Vivero, Spain, N. Coast -	3 0	15		Welcome B., Patagonia, W. Coast.	0 50	7½	
Vladimir, St., Bay, G. of Tartary.	irr.	2		Wellesley Is., Australia, N. Coast.	7 30	8-12	
Volcano Ids., China, E. Coast.	11 30	15	7½	Wellfleet, United States	11 5	13½	12
Voronov C., White Sea -	11 20	17		Wells, England -	7 0	12	
Waagoe Fiord, Faeroe Ids.	6 0	9½	7½	— Bar, England -	6 20	18	
Waddington Harb., Bute Inlet, B. Columbia.	6 0	13		Wenman Isles, Galapagos	2 10		
Wahaay Harb. (Ceram), N. Coast, Moluccas.	6 0	3		Weser (outer light vessel), Germany.	11 30		
Waikato R., New Zealand.	9 30	12	9	West Cove, Kenmare R., Ireland.	3 52	10	7½
Walker Creek, Choiseul Id., Falkland Ids.	6 20	5½		— Gat, Netherlands -	1 45	7	
—, R. Tyne, England.		10½		— Hill, Australia, E. C.	10 20	■	
Wallace Har., Nova Scotia	10 30	8	5	West Quoddy, B. of Fundy	11 12,	21	17
Wallis Id., Torres Strait	irr.	7		West River, China, E. Coast, see Si Kiang.			
Walvisch Bay, Africa, W. Coast.	1 54	6		Western Port, Australia, S. Coast.	1 10	8	6
Wanchu R. (entrance), China, E. Coast.	9 0	15½		Westmanshaven, Faeroe Ids.	8 0	9½	7½
— (City), China, E. Coast.	9 30	15½		Westness, Orkneys -	9 11	10	7½
Wang-kia Bay, Yellow S.	2 30	9	7	Weston-super-mare, England.	6 54	37	28½
Wang-kia-tia Bay, Yellow Sea.	6 0	12	9	Westport, Ireland -	4 57	12½	9½
Wanganui R., New Zealand.	10 15	8	6	Wexford, Ireland -	7 21	5	3½
— Inlet, New Zealand.	11 20	7	6	Whampoa { In March -	1 40	} 7-8	
				(Docks), { In April -	1 15		
				China { In May & June	0 30		
				See foot note, p. 169.			

Place.	High Water, Fall and Change.	Rise.		Place.	High Water, Fall and Change.	Rise.	
		Spring.	Neap.			Spring.	Neap.
	h. m.	ft.	ft.		h. m.	ft.	ft.
Whitby, England -	3 45	15	11½	Wusang River (entrance),	0 30	13	13½
Whist Dog Id., China, E.C.	9 0	18		Yang-tse-Kiang, China,			
Whitehaven, England -	11 14	23½	18½	E. Coast.			
— Nova Scotia	8 0	8½	4½	— (Pheasant Point)	0 35	13	5
Wick, Scotland -	11 22	10	7½	Wynkoops Bay, Java -	3 0	4½	4
Wicklow, Ireland -	10 29	9	6½	Yang ho, Yellow Sea -	0 15	5	
Wide Bay, Australia, E. C.	9 14	10	7	Yang-tse Kiang (en-	12 0	15	1½
Widewall, Orkneys -	9 3	10	7½	trance), China, E. Coast.			
Wigton, Scotland -	11 30			Yarmouth Haven (Brus)		5½	4½
William Pt., Falkland Ids.	5 15	7	5½	England.			
— New Zealand	12 45	8	6	— Bay of Fundy	10 9	16	13
— Scotland, W.C.	11 10	18	10	— Bridge, England		5	4
Willis Islets, Australia,	8 0	6		— Road, England	9 15	6	4
E. Coast.				— Isle of Wight,	10 0	7	6½
Willoughby Cape, Kan-	4 10	■		England.	12 0		
garoo Id., Australia.				Yealm River, Bigbury	3 37	16½	11½
Wilmington, United States	9 6	3	2½	Bay, England.			
Wilson Promontory, Aus-	2 0	10		Yedo Bay, (Yoku-hama)	6 0	6½	4½
tralia, S. Coast.				Japan.			
Winter Harb., Melville Id.	1 30	3½		Yellaboi, Africa, West	7 10	10	
Winterton Ridge, England	7 50			Coast.			
Wisbeach, England -	7 30	15		Yeu, Ile d', France -	3 6	14½	10
Wisbeach Eye, England		20		Ylo Road, Peru -	8 15	6	
Wivenhoe, Colne River,	12 10	15	10	Yndependencia B., Peru	4 50	4	
England.				Yoku-hama, Yedo Bay,	6 0	6½	4½
Wolstenholm Sound,	11 8	7½		Japan Sea.			
Arctic Regions.				York C., Australia, East	11 15	10	7
Woodbridge Haven (Bar),	11 45	12	9	Coast.			
England				— Factory, Hudson Bay	11 15	10-14	
— (Kingston	0 35	10		— River (Moody's	9 35	3½	
Quay), England.				Wharf), United States.			
Woodbridge, (Wilford	0 55	7		— Road, Magellan St.	2 0	9	
Bridge), England.				Yonghal, Ireland -	5 14	12½	10
Woodlark Id., Louisiade	7 15	4		Yung R., Chinhae, China,	11 20	12½	
Archip.				E. Coast.			
Woods Hole (entrance	8 34	2	1½	— Ning-po-fu,	1 0	9	
from Vineyard Sound),				China, E. Coast.			
United States.				Yung-hing Bay, Japan S.	5 20	2½	
— (entrance	7 59	4½	4	Yura Harbour, Japan Sea	6 5	6½	
from Buzzard Bay),				Zambesi River (Pearl Id.),	4 30	12-15	
United States				Africa, E. Coast.			
Woolwich, England -	1 37	18½	15½	Zansibar, Africa, E.C. -	5 20	10	
Workington, England -	11 4	20	15	— (Channel)	4 15	11	
Wrabness, Stour River,	12 29	12		Africa, E. Coast.			
England.				Zaudzi, Mayotta, Comoro	4 10	12	
Wranger Oog, Germany	12 0	9?		Ids			
Wrath Cape, Scotland -	7 30	15½		Zebu Port, Filipinas -	12 0	7	
Wreck Reef, (Bird Islet)	8 3	6		Zeyla, Africa, E. Coast	7 15	8½	
Australia, E. Coast.				Zieriksee, Netherlands -	2 0	11	9
Wuchu, Si Kiang, China,		1-1½					
East Coast.							

L O N D O N :

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